

MAY  
1954

# chemical processing

*for men who manage*

*Highlights*

... ultraviolet . . . . 18  
... absorber is one of 28  
... chemicals described

... waste water 1000  
... faster . . . . . 38

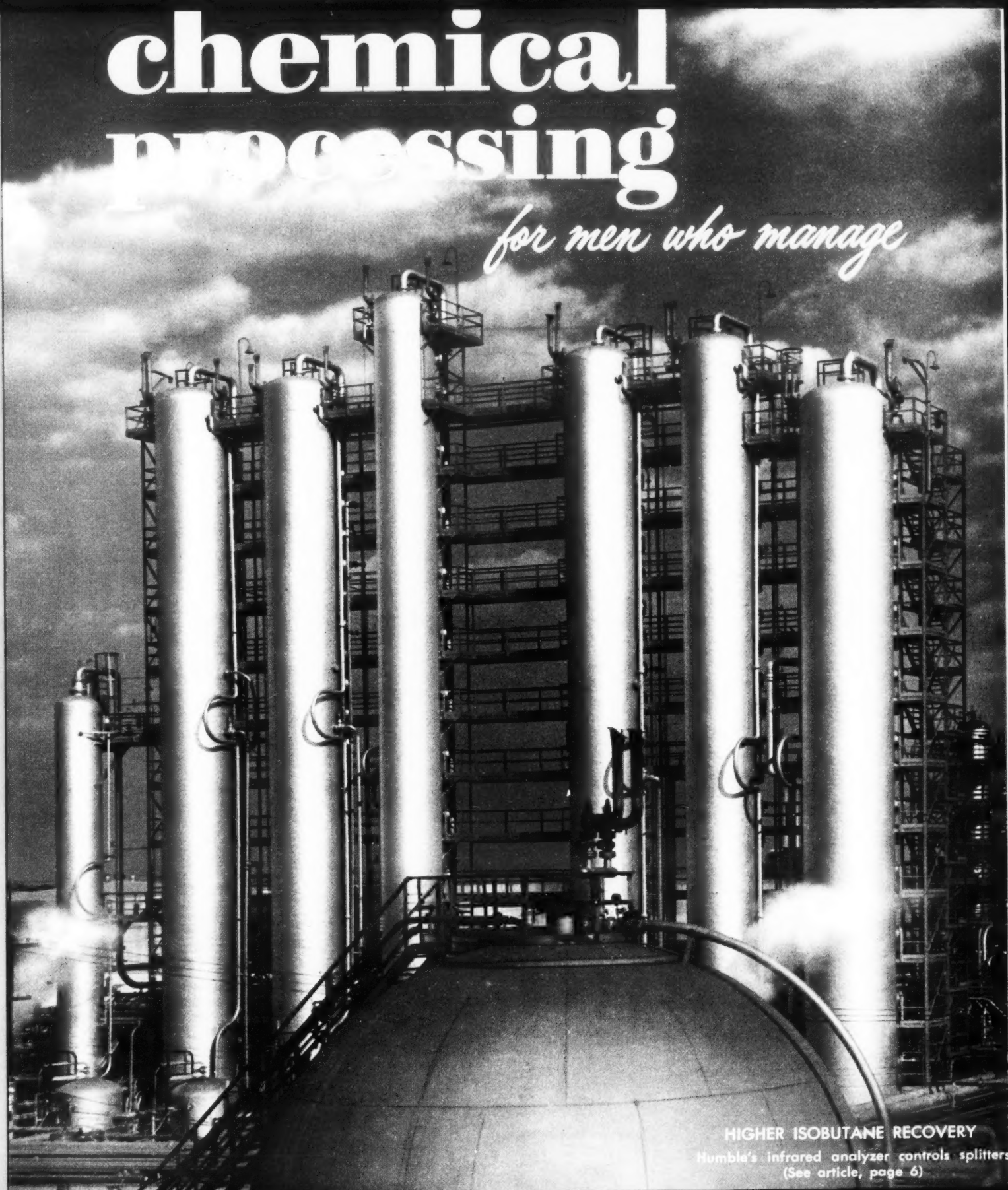
... with 18 ideas from  
... industries

... automatically finds end-  
... in ion exchange . 66

... feature of this month's  
... uments section

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... vital editorial; "hand-picked" cir-  
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## HIGHER ISOBUTANE RECOVERY

Humble's infrared analyzer controls splitters  
(See article, page 6)

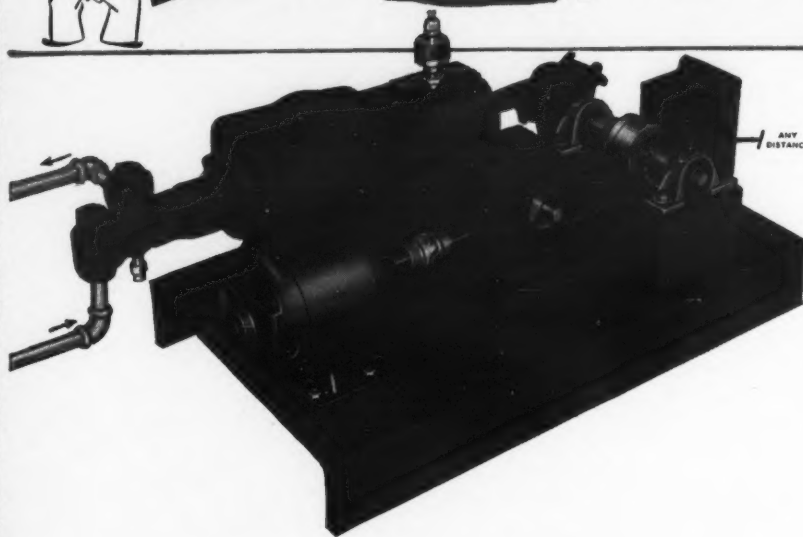


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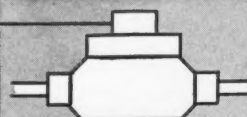
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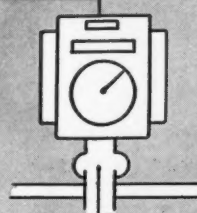
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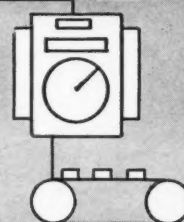
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## "That's Interesting"

### Plastic nets fish

A new industry has been born in Japan. Dow Chemical International Ltd. and a Japanese chemical firm have started manufacture of saran monomer and polymer plastics in a Kyushu plant. Chief among final uses for these plastics will be saran nets for Japan's vast fishing industry.



### Fish nets plastic

On the other side of the world, the Norwegians have developed a process for making plastic from fish protein. Originating in skins and fresh waste from fish filets, the plastic "netted" is said to have properties comparing favorably with established thermosetting molding materials.

### Meteor film

One of the operating secrets of the meteor camera at the Harvard College Observatory is bowl-shaped photographic film. This special film, produced by Eastman Kodak Co., is needed to accurately record tracks of meteors as they race through the sky.

### Light flattery

On the boardwalk in Atlantic City a new lighting system is planned for next year. Of the mercury vapor type, it is to be "color-corrected" to eliminate that greenish tinge that puts milady's physiognomy in an unflattering light. (Dyelines and Bylines)

For more information on product at left, specify CP 8118 ... see information request blank between pages 2 - 3.

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# chemical processing

(CHEMICAL PROCESSING PREVIEW)

For MEN WHO MANAGE

Vol. 17 May, 1954 No. 5

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When inquiring check CP 8119 on handy form, pgs. 2-3

MAY, 1954

# In this Issue

## editorial highlights

Humble Oil nets isobutane with infrared analysis	6
Paint tinting operation goes faster	8
Actinic absorber stops ultraviolet	18
Clarify waste water 1000 times faster	38
Armour assures safety in handling hazardous vapors	54
Automatically determines end-point in ion exchange	66
Quick checks of moisture save oils, chrome for tanner	84
Du Pont cuts cost of drilling "weep" holes	114
Rapid liquid-liquid extraction with centrifugal unit	138
Pump lifts high-viscosity resin 40' at 16 gpm	148

## editorial sections

That's Interesting	2	Packaging	126
New Solutions of Processing Problems	6	Expanding Chemical Production	136
Materials	18	Processing Equipment	138
Ideas	38	Engineering & Maintenance	148
Safety	54	New Literature	188
Instrumentation & Control	66	Processing and Engineering Data	190
Recent Books	82	Convention & Exhibit Schedule	212
For the Laboratory	84	Advertisers in This Issue	217
Material Handling	98		
Briefs	112		
Corrosion Control	114		

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1. When you want more information on processes, controls or developments of products discussed in this issue, see Reader Service slip opposite page 2

2. If you are looking for information on specific products, use the Product Director "Quick-locator" for all types of materials, instruments, processing equipment, etc. This Product Directory lists everything in this issue, with page references 213

3. If you want to subscribe to this magazine, see reader-qualification form opposite page 3

## Points of interest



Several times in the past we have called your attention to various features of **CHEMICAL PROCESSING** designed to help you — the reader. Chief among these are the Reader Service Slip, the Directory (or Index), and the fact that the book is sectionalized.

We trust you are familiar with these features by now, so may we direct you to some other points of interest? One of them begins on the next page — the Guest Editor's column. Each month in this column are presented ideas as voiced by a leader in the chemical or an allied industry. The subject matter is timely and varied — and as you read, you'll probably find a reflection of, or some stimulus for, your own thinking.

Also of interest, (inside the front cover), are several "squibs" under the heading "That's Interesting." These newsy bits, gathered from here and there, represent some of the more unusual ideas and applications of products or processes. Incidentally, you'll find some more "That's Interesting" just inside the back cover.

We invite you to 'visit' and enjoy these points of interest as you glean ideas from CP.

*Roy G. Helsing*

ASSISTANT EDITOR



## We Must Keep Telling Our Story

WILLIAM C. FOSTER

President Manufacturing Chemists' Association



It will be two years next month since the Board of Directors of the Manufacturing Chemists' Association received the results of an opinion survey of the chemical industry conducted by Opinion Research Corporation.

The results of this survey confirmed what many in the industry suspected. Not only did a large percentage of the public not understand our industry, but many of them actually had hostile feelings toward it. Four out of ten of those interviewed felt that it was not desirable to have a chemical company in their community. More than half felt the chemical industry was an unhealthy business in which to work, and 67% felt there was not enough competition in the industry.

There were many favorable opinions expressed, of course. For example, chemistry was found to have widespread appeal as a career. Over 80% rated our industry as "very important" in time of war. But underlying the opinions, both favorable and unfavorable, was the point that just 4% felt they knew as much about our industry as they did about six other basic industries. Few people say they have read or heard much about the chemical industry. A

(Continued on page 211)

### Editor's Note —

We believe that you owe it to yourself to read Mr. Foster's eye-opening figures. We especially hope that you will read the two requests he makes in the last two paragraphs on page 211.

# "NICHOLSON TRAPS PROVE THEMSELVES"

## ...in plant of one of Big 6 chemical firms

The importance of improving heat transfer efficiency in today's great processing plants increases as the proportion of critical applications grows and steam consumption mounts. The letter at the right is from one of the great chemical companies which have adopted Nicholson traps. Another of them recently reported that Nicholson traps were installed at one of their plants as part of a campaign to promote economical steam use. It resulted in a yearly saving of \$500,000. See why an increasing number of leading plants are standardizing on Nicholsons.

### Send for TRAP CATALOG 953

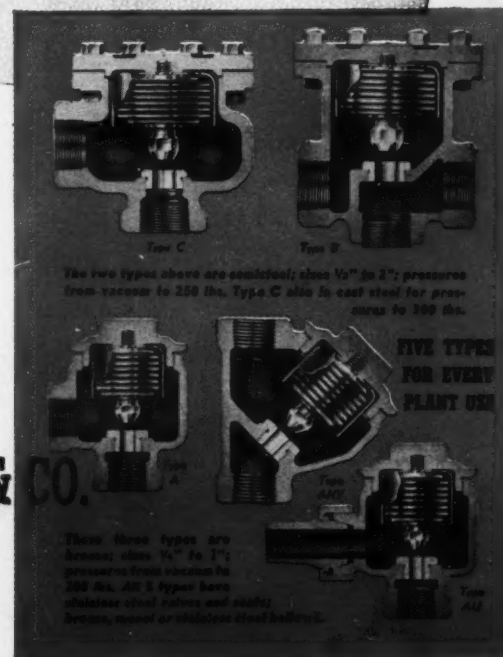
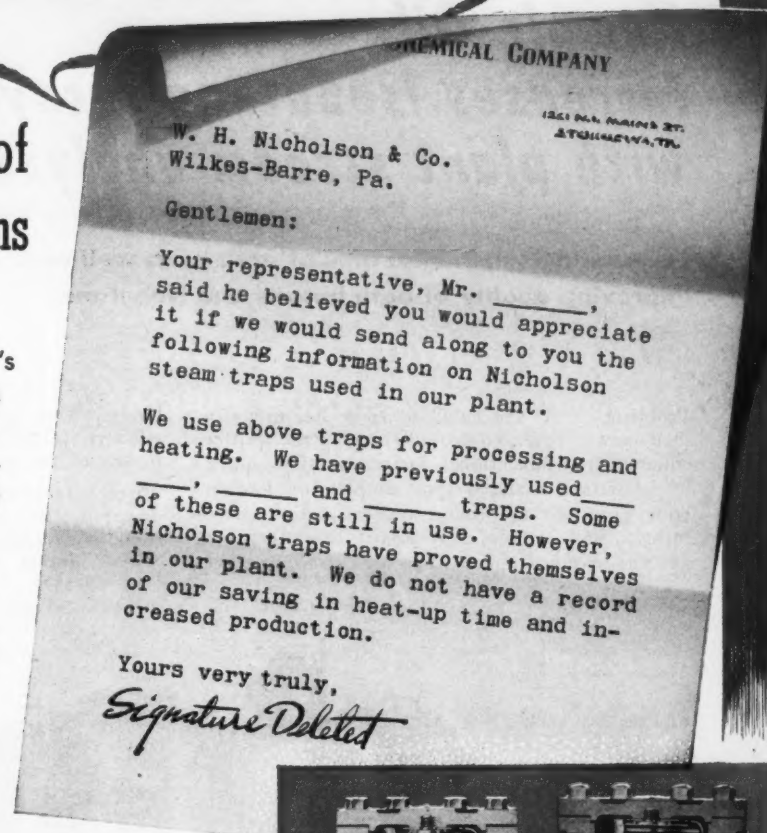
This 32-page standard reference is complete with installation diagrams as well as charts and formulae for determining proper size of trap.

## W. H. NICHOLSON & CO.

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When inquiring check CP 8120 on handy form, pgs. 2-3

## **Humble Oil increases isobutane recovery with plant stream analyzer**

**. . . making substantial annual savings as well as  
improving quality of both butane and isobutane**

**Problem:** At the Humble Oil & Refining Co. in Baytown, Texas, control of three butane splitter columns by conventional instrumentation, aided by laboratory analyzed spot samples, resulted in wide variations in product quality and excessive losses. Spot samples sent to the laboratory for analysis involved normal time lags of six to eight

hours. This time lag was too great to permit effective control of the fractionators based on results of the analyses.

Three butane splitter columns operate essentially in parallel service. Charge stock to fractionators contains a variable mixture of 30-45% isobutane, 50-65% normal butane, 1-5% propane, and about

1% isopentane. Isobutane and propane are taken overhead while normal butane and isopentane are withdrawn as bottoms.

Most economical operation is obtained when isobutane loss to bottoms is maintained at a value 1 to 5% of bottom product. Concentrations greater than this represent excessive loss of isobutane while lower concentrations lead to excessive contamination of overhead product. Isobutane content of bottoms under former method of operation varied from less than 1% to as high as 26%.

Two of the columns are 45-plate distillation units and the third column contains 40 plates. Feed stock is charged at either the 27th or 28th plate from bottom of towers, each of which is equipped with a steam reboiler. Operation of fractionators is based on material balance, with overhead and charge streams depending on rate of flow control. Bottom and reflux rates are controlled by liquid level in reboiler and overhead accumulator respectively. Pressure may be controlled either by water to overhead condenser or by steam to reboiler. Control of product quality is accomplished by adjusting overhead flow based on analysis results.

Fig 1—Monitoring of three distillation columns in this Light Ends Fractionation Unit with an infrared analyzer has resulted in improved operation

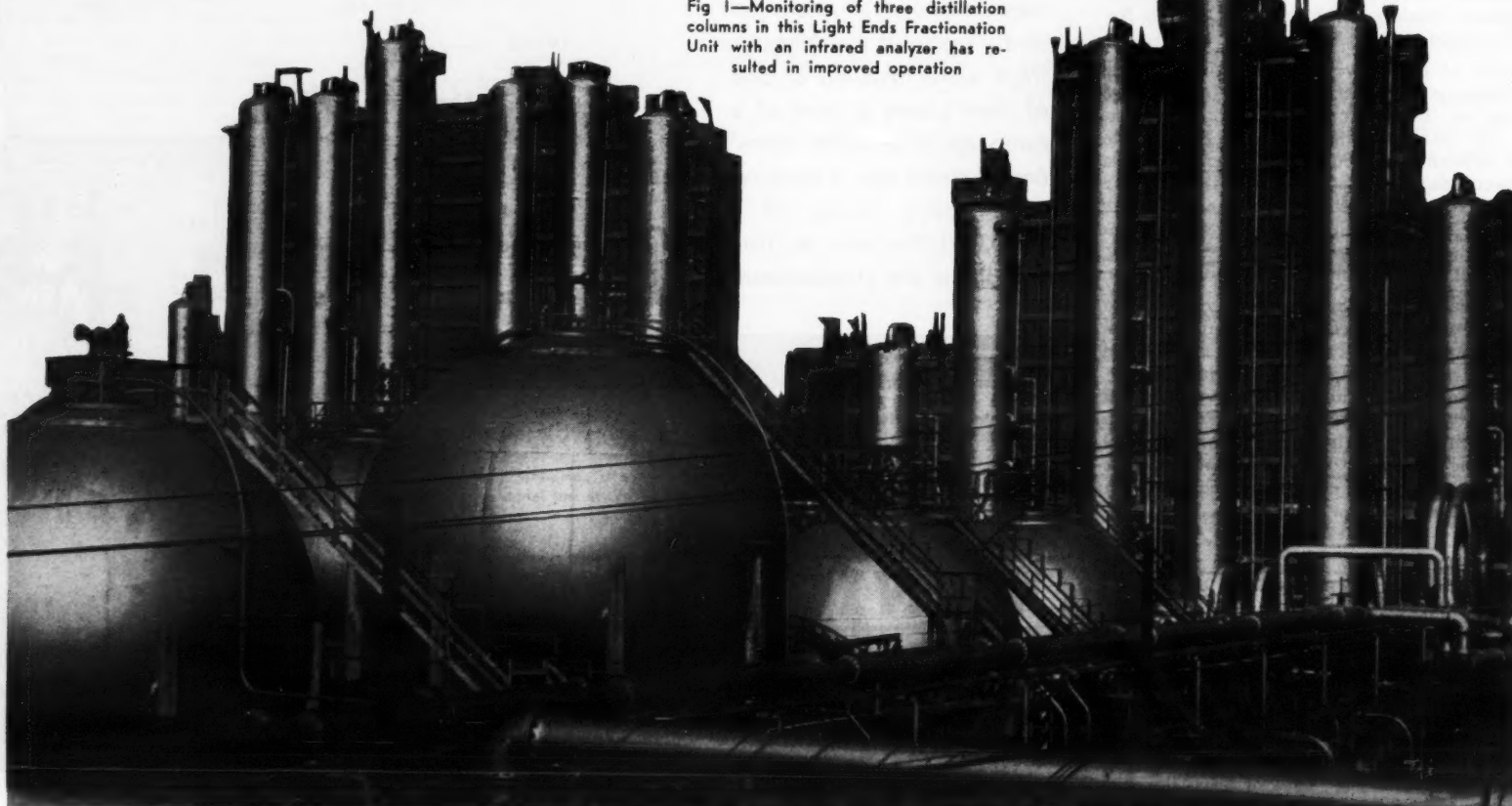


Fig 2—opened models

Solution: installed analyzer. This does not require both units for analysis of unit. Standard of analysis laboratory of analysis are

Infrared amplifier recorder. Standardization in main Analyze are located from control analyzer able for service.

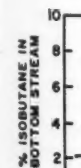


Fig 3—fore





Fig 2—Explosion-proof cover of infrared analyzer is opened so an adjustment can be made. More recent models of instrument are smaller in size and lighter

**Solution:** Three and one-half years ago, Humble installed an infrared continuous plant stream analyzer in the refinery for butane splitter control. This double beam non-dispersion type unit monitors bottom product streams from all three columns for isobutane content. It also periodically analyzes a reference sample as a check on accuracy of unit. Effects of drift are minimized by incorporation of automatic standardization system. Standardizer automatically readjusts zero position of analyzer each hour on basis of preset value for laboratory analyzed reference sample. Operation of analyzer, sample switching and restandardization are completely automatic.

Infrared analyzer is equipped with a separate pre-amplifier, voltage regulator, and a strip chart recorder. These items, along with automatic standardization system, are mounted on a panel board in main control room for three fractionators. Analyzer, cycle timer, and sample handling system are located in a separate 6 x 8' house about 75' from control room. All equipment located in analyzer house is of explosion proof design suitable for Class I, Group D, Div. 1 hazardous gas service.

(Continued on page 10)

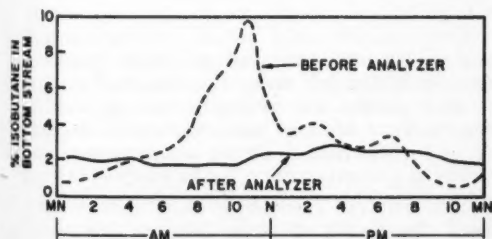


Fig 3—Example of operation of butane splitters before and after installation of infrared analyzer as shown by results from one of columns

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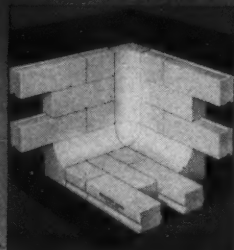
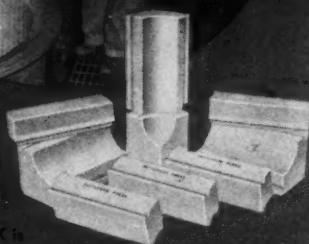


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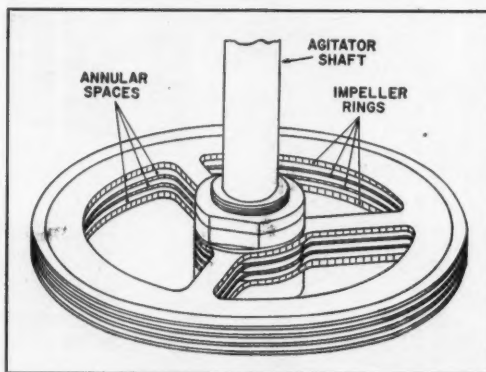
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**new solutions  
of processing problems**



Line of mixers with disc-type impellers in McDougall-Butler's tinting room

***paint tinting operation goes faster  
since paddle mixers were replaced***



Velofin impeller consists of cut rings spaced along agitator shaft

**Disc impellers keep production rolling at McDougall-Butler, foster cleaner work area because they minimize splashing**

**Problem:** Up until the fall of 1950, paint manufacturer McDougall-Butler Co., Inc., Buffalo, N. Y., used paddles for mixing in tinting and let-down tanks. Mixing was slow with this method, and it was hard to do the necessary number of tints in a working day. Tanks which could be employed elsewhere were tied up unnecessarily.

**Solution:** In the fall of '50 the company started to add a mixer called the Velofin, and today it has 14 of them in use — 10 on 150-gal tanks and four on 300-gal tanks.

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In most cases, the Velofin impeller is used alone, but McDougall-Butler has modified that idea in some cases (where batch is particularly heavy) by adding a propeller to the shaft, under the Velofin impeller. A number of other installations have since been reported in operation where even heavier materials are being mixed successfully by the Velofin impeller alone.

The friction-type disc impeller of the mixers is effective in liquids of any viscosity, even semi-solids, but is particularly suited for non-Newtonian flow. It consists of a set of flat rings or annuli spaced one above the other on the agitator shaft. Capacity is changed by changing number of rings or the spacing between them.

Fluid enters impeller axially, through ring openings near shaft. As it enters space between two adjacent rings, the flow becomes radial in a helical path, and accelerates because of the surface friction of the rings. Eventually it leaves the impeller from the periphery of the rings.

**Results:** Tinting and let-down are done much quicker as a result of the much faster mixing action. No longer is it difficult to keep up with the production in this operation. Surroundings are cleaner because Velofin doesn't splash as much as paddles.

(The Velofin is a product of H. E. Serner Co., Dept. CP, 26 Journal Sq., Jersey City 6, N. J. . . . or for more information check CP 8123 on handy form, pages 2 and 3.)

**Large fermentation tanks guarded against contamination by resin-base coating . . .**

material can be cleaned or sterilized with steam

**Problem:** The Upjohn Company, Kalamazoo, Michigan, must constantly be on guard to avoid contamination in the 5000-gal units in which penicillin and streptomycin are fermented. These metal-sensitive antibiotic pharmaceuticals may be affected adversely by bare metal, particularly carbon steel.

**Solution:** Tanks are lined with a coating based on Bakelite phenolic resins. This prevents contact with the bare metal and also makes cleaning easier.

**Results:** Heat-resistant coating can be cleaned or sterilized with steam, thereby facilitating cleaning operations. It has high abrasion resistance and withstands rapid thermal changes and sustained immersion at high temperatures. Antibiotic pharmaceuticals ferment with much less danger of contamination in tanks lined with this inert coating.

(LC-19 phenolic resin-base coating used to line fermentation tanks is produced by Lithcote Corp., Dept. CP, 333 W. 40th Pl., Chicago 9, Illinois . . . or for more information check CP 8124 on the convenient Reader Service slip which is located between pages two and three.)

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**Why is ROTO-CLONE lower priced?** The Type W is strictly a product of AAF research—features a patented design that combines high efficiency with inexpensive construction. Result—the lowest priced wet dust collector in its class (units of 1,500 to 50,000 cfm capacity designed for high efficiency dust collection, including extreme fines).

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**Hooker sodium tetrasulfide** is a dark red aqueous solution con-

taining 40% by weight of  $\text{Na}_2\text{S}_4$ . The solution contains less than 1% sodium thiosulfate, sodium carbonate, and sodium sulfite inclusive. It is shipped in 55-gal. steel drums, 600 lbs. net.

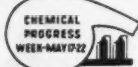
**Hooker sodium sulphydrate**, a light lemon-colored solid in flake form, is completely and rapidly soluble in water and alcohol. It is an exceptionally pure material containing 70 to 72%  $\text{NaSH}$ . It is supplied in lacquer-lined steel drums, 90 and 350 lbs. net.

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Address.....  
City..... Zone..... State.....

## NEW SOLUTIONS of processing problems

(Continued from page 7)

Analyzer case is thermostated to a constant temperature of 130°F. During summer months it is necessary to provide forced air circulation around outside of case to increase heat loss sufficiently to allow thermostat to function properly. Permanently connected ammeter on AC supply to thermostatic heater and control circuit is useful in detecting any possible difficulty in temperature control unit.

Sampling points on the three columns range from 100 to 200 feet from analyzer house. Liquid sample is withdrawn at 110 psi, then expanded to a pressure of about 5 psig before passing to analyzer. Each sample stream is continuously vented at about 200 cc/min at analyzer to provide continuously fresh samples with minimum time lag. Separate drum is used to handle supply of reference sample.

Vented manometer is attached to sample line into analyzer to serve as a safety device to prevent overpressuring cells. Precautions are also taken to prevent liquid from entering analyzer. Electronic relay is installed to detect presence of liquid in a trap placed in sample line. In event liquid is detected at this point, a solenoid valve automatically closes in the sample line.

**Results:** Use of the infrared analyzer has provided a marked improvement in operation of the fractionators, resulting in increased isobutane recovery. In this way instrument enables a substantial annual saving to be made.

Control of columns with aid of analyzer has also improved the quality of both butane and isobutane. Isobutane in bottom streams now ranges from 2 to 8%, instead of 1 to 26%. Reason for improved operation is that analytical time lag has been reduced to as little as five minutes in place of six to eight hours. Reduction of samples sent to laboratory has released considerable manpower for other necessary work.

Range for which analyzer is calibrated is 0-20% isobutane. Sensitization has resulted in suppressing sensitivity of unit to isopentane to about 1/5 that of isobutane. With relatively small quantity of isopentane present, a concentration of plus or minus 1% isopentane results in less than 0.2% error in isobutane. Spot samples from each of columns are sent to laboratory each shift as a check on accuracy of instrument. Comparison of analyzer results with these laboratory analyzed spot samples indicates satisfactory agreement, usually within 0.2 to 0.3%.

Routine maintenance of analyzer, consisting primarily of daily observation for signs of difficulty, is estimated to be about 15 to 16 manhours per month. Considerable development work was necessary when instrument was first acquired to fit it into the operation. However, production supervisors at the refinery consider that the resulting improvement in control is well worth the effort.

(For more information on infrared plant stream analyzer reader may simply check CP 8127 on the convenient Reader Service slip which is located between pages two and three.)

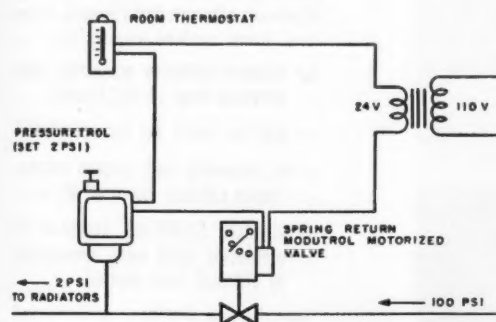
When inquiring check CP 8126 on handy form, pgs. 2-3



### Simple system controls letdown of 100-psi steam to 2-psi . . .

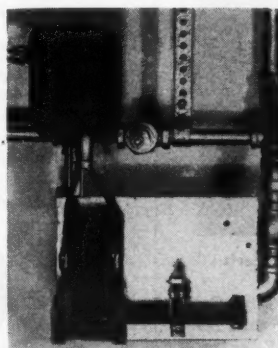
steam flows only when both room temperature and steam pressure fall below a set point

Use of a self-contained pressure reducer is a simple way for obtaining low pressure steam for room and factory heating purposes. This method, however, has several limitations. For example, if it is desired to obtain 2 psi steam from a 100 psi line, the actual pressure obtained is likely to fluctuate considerably depending on the demand for low pressure steam. In addition, where it is desired to regulate the steam flow according to heating requirements, a room thermostat and control valve must be installed.



Pressure reducing installation, including transformer, features simplicity of layout and economical material requirements

System in use at Chicago plant of Borden Co. is compact and accessible to maintenance workers. Valve shown below relay box was designed by Borden Co. and is substituted here for Modutrol motorized valve



Carl E. Wigner, Chief Engineer in the Chicago plant of Borden Co., recently replaced a pressure reducer with a positive pressure regulator to control pressure by operation of the same electrically operated solenoid valve that the thermostat uses. By connecting the thermostat and pressure regulator in series (see diagram) steam is admitted to the low pressure main only when both the temperature and pressure fall below a predetermined point.

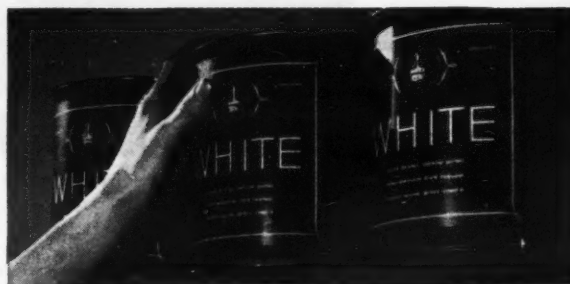
(Pressure regulator described is the Pressuretrol and Modutrol, manufactured by Minneapolis-Honeywell Regulator Company, Brown Instrument Division, Department CP, Wayne and Windrim Avenues, Philadelphia 44, Pennsylvania . . . or for more information concerning manufacturer's product, reader may simply check CP 8128 on convenient Reader Service slip found between pages two and three.)

## How Dowicide Preservatives solved bacteria problem for paint industry

*Added to water-based latex paints, Dowicide Preservatives prevent bacteria breakdown of protein and extend paint shelf life*



DOWICIDE PRESERVATIVES made this difference. Latex paint control sample (left) was exposed for 20 days at room temperature (70°-75°F.). Bacteria attack caused the paint to "separate out"—and bad odors to develop. The protein lost its suspending powers and the pigment settled out. Test sample with Dowicide Preservatives added (right) was exposed to the identical conditions. Damaging bacterial action was prevented—protein was not degraded, pigment stayed in suspension.



Dealers' investment is protected during long periods of paint storage. Dowicide Preservatives maintain the easy-to-prepare and easy-to-mix characteristics that make latex paints so popular with the increasing "do-it-yourself" market.

Industry generally is increasing manufacturing efficiency and improving product quality by using Dowicide® Preservatives. Fourteen different Dowicide Preservatives currently bring appreciable, specific benefits to the paint, paper and pulp, petroleum, leather, textile, adhesives, farming and other industries. Full information on profitable use of these versatile Dowicide Preservatives in your processing or selling operations can be quickly had by writing THE DOW CHEMICAL COMPANY, Midland, Michigan.

THE DOW CHEMICAL COMPANY  
Dept. DO 727C, Midland, Michigan

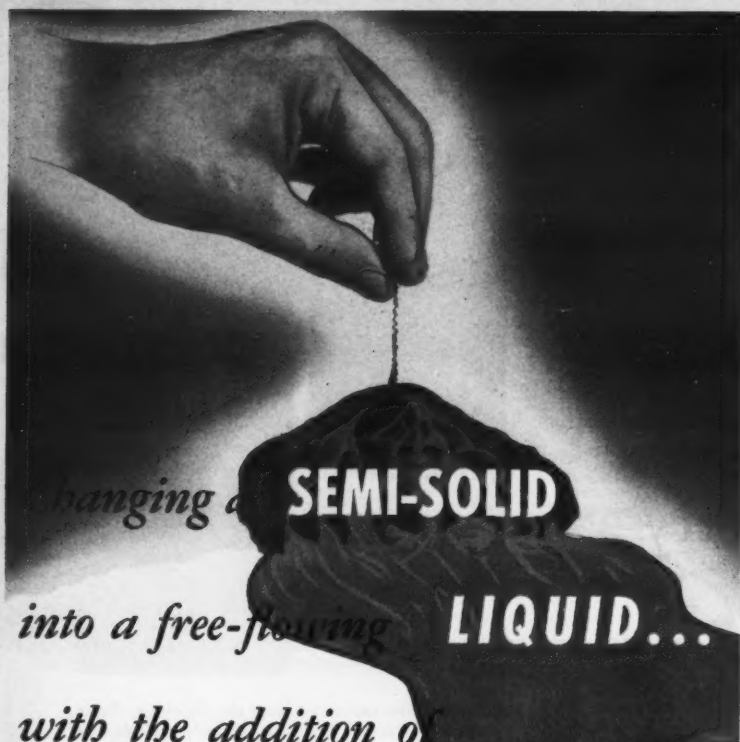
Please send me detailed information on the uses of Dowicide Preservatives.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

you can depend on **DOW CHEMICALS**



When inquiring check 8129 on handy form, pgs. 2-3



Changing a **SEMI-SOLID**  
into a free-flowing **LIQUID...**  
with the addition of  
**MARASPERSE**  
**THE low cost, HIGHLY EFFECTIVE DISPERSANT**


With the addition of from 0.05% to 3.0% of MARASPERSE, up to 300% MORE SOLIDS MAY BE DISPERSED and maintained in fluid suspension.

You can use Marasperse to:

1. Increase the solids content of slurries without increasing either the viscosity or the volume.
2. Change semi-solids into free-flowing liquids without adding water.
3. Make stable oil-in-water emulsions.

If you have a process, or a use involving one of your products, which requires water suspensions of insoluble materials, investigate the use of Marasperse dispersants.

Write for File No. 801 for additional information on Marathon's low-cost Marasperse. You'll receive interesting and informative technical data.

 **MARATHON** Corporation  
CHEMICAL DIVISION  
ROTHSCHILD • WISCONSIN

When inquiring check CP 8130 on handy form, pgs. 2-3

## NEW SOLUTIONS of processing problems

**Hot sulfuric acid and HCl haven't hurt alloy parts in 4½ years...**

hollow agitator shafts now part of blow-off for kettles making dye intermediates

**Problem:** When Zinsser and Company, Hastings-on-Hudson, New York, changed its process for making dye intermediates, corrosion of equipment became excessive. Mixing propellers, shafts, thermometer wells, and blow-off lines had to be replaced every three months. Kettle linings chipped when corroded propellers spun off shafts. This meant more expense for lining repairs.

Several 500 gal kettles are used, each heated to 200°C. They are subjected to concentrated sulfuric acid first. Later in the process, highly corrosive hydrogen chloride gas is liberated.

**Solution:** After trying a number of corrosion-resistant alloys, Hastelloy alloy D was adopted for the parts.

Shafts, over 8' long, are made of Hastelloy alloy D pipe. At top, hear stuffing box, where corrosive



Dye intermediate kettle has corrosion-resistant parts

conditions are most severe, OD is 3-3/16" and ID is 2-5/32". Bottoms of shafts are 2½" extra-heavy pipe. A 24" Hastelloy alloy D propeller is fitted to bottom of each shaft (turns at 130 rpm). Thermometer wells are made of 1" ID extra-heavy pipe with welded collars.

**Results:** Parts show no sign of corrosion after being in service for 4½ years.

Pipe agitator shafts now serve as part of kettle blow-out line. After reaction, intermediates are forced up hollow shaft by 15-psi air. Top of shaft is coupled to external Hastelloy alloy D blow-off line which carries intermediates to next processing stage.

(Hastelloy alloy D is product of Haynes Stellite Company, Division of Union Carbide and Carbon Corporation, Dept. CP, Le Van Bldg., Kokomo, Ind. . . . or for more information concerning manufacturer's product, reader may simply check CP 8131 on the convenient Reader Service slip which is located between pages two and three.)



Get more production from your present processing equipment. Increase capacity by eliminating space-wasting foam with Dow Corning silicone defoamers. Here are some typical examples:

- ✓ standard molasses processing load increased from 18 to 24 tons!
- ✓ yield on textile vat dyes doubled!
- ✓ in processing food, vacuum concentration capacity increased 60%!
- ✓ proposed \$2,000,000 expansion of processing plant made unnecessary by efficient foam control!

Dow Corning Antifoam A Compound and Antifoam AF Emulsion are the most versatile and economical defoamers on the market. Effective at remarkably low concentrations, they pay for themselves time and again in more complete use of process equipment and shorter processing time, and in the elimination of waste and fire hazards. Both defoamers are tasteless, odorless and physiologically harmless.

For more efficient foam control . . .



Dow Corning Corporation, Dept. BB-17  
Midland, Michigan  
Please send me data and a free sample of  
☐ Dow Corning Antifoam A  
or ☐ Dow Corning Antifoam AF Emulsion

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 8132 on handy form, pgs. 2-3

CHEMICAL PROCESSING



## NEW SOLUTIONS

### No contamination results with titanium vapor vacuum pump

Development of titanium vapor vacuum pump for precise experimentation using an electrostatic generator is said to show promising results.

Continuous operation is achieved by evaporating a titanium wire in the vacuum chamber by contact with an electrically heated carbon rod. Titanium condenses on chamber walls. Molecules of gas combine forming stable compounds. The inert gases are ionized, migrate to the chamber walls, and are buried by condensing titanium.

Contaminants, troublesome in X-ray and nuclear research, are not present. Further development of pump is necessary.

(Details from paper presented at American Physical Society annual meeting, Chicago, Illinois by Herb, Divatia, and Davis, University of Wisconsin, Madison 6, Wisconsin.)

### What to use for check of O<sub>2</sub> in gases

Recent literature emphasizes importance of industrial gas analysis in operations where oxygen is the principal contaminant. Bulletin outlines recommended list of equipment which would provide an accurate and dependable analysis system.

Supplementing the above is a second bulletin which illustrates and describes operation of a sampling system for dry gas samples encountered in many chemical operations.

Bul AD-610 and 702 are issued by Arnold O. Beckman, Inc., Dept. CP, 1020 Mission Street, South Pasadena, California. When inquiring reader may simply specify CP 8133 on the convenient Reader Service slip which is located between pages two and three.

For more information on product at right, specify CP 8134 . . . see information request blank between pages 2 - 3.



Factory-cut, curved FOAMGLAS blocks for the sidewalls and smaller pieces for the knuckle radius of the heads (cut and fitted on the job as shown here) were easily installed by Columbia-Southern workmen.

0° to 5° F.

## FOAMGLAS tank insulation solves a costly maintenance problem for COLUMBIA-SOUTHERN

FOAMGLAS insulation on five chlorine weighing tanks has practically eliminated expensive insulation replacement and maintenance for Columbia-Southern Chemical Corporation. Chief Engineer G. L. Cobb of their Natrium, West Virginia, plant explains:

"Previous tank insulations absorbed too much moisture. Since the equipment operated at 0° to 5° F., the moisture formed ice behind the insulation separating it from the tank walls. As a result, the old insulation constantly fell off, and frequent replacement was necessary.

"FOAMGLAS solved this problem because it *stays dry* . . . its sealed glass

cells *can not* absorb moisture. Since we installed FOAMGLAS more than six years ago, maintenance and replacement have not been a problem. Furthermore, its moisture-proof property has assured us constant insulating efficiency."

Solve *your* insulating problems with FOAMGLAS, the unique cellular glass insulation. It is moisture-proof, acid-proof, fireproof and has a strong, rigid structure.

Send for our new booklets describing its use for tanks and other equipment; piping; or walls, floors, roofs and ceilings. It'll pay you to use the handy coupon right away.



G. L. Cobb, Chief Engineer  
Columbia-Southern Chemical Corp.

### PITTSBURGH CORNING CORPORATION

One Gateway Center • Pittsburgh 22, Pa.

# FOAMGLAS®

the cellular, stay-dry insulation



Pittsburgh Corning  
also makes  
PC Glass Blocks

Pittsburgh Corning Corporation, Dept. CP-54  
One Gateway Center, Pittsburgh 22, Pa.

Please send me a free sample and the following brand new FOAMGLAS literature:

- ☐ New booklet on FOAMGLAS building insulation.
- ☐ New booklet on FOAMGLAS low temperature insulation.
- ☐ New folder on FOAMGLAS pipe insulation.
- ☐ New folder on FOAMGLAS insulation for tanks and other equipment.
- ☐ Send engineer to discuss specific problem.

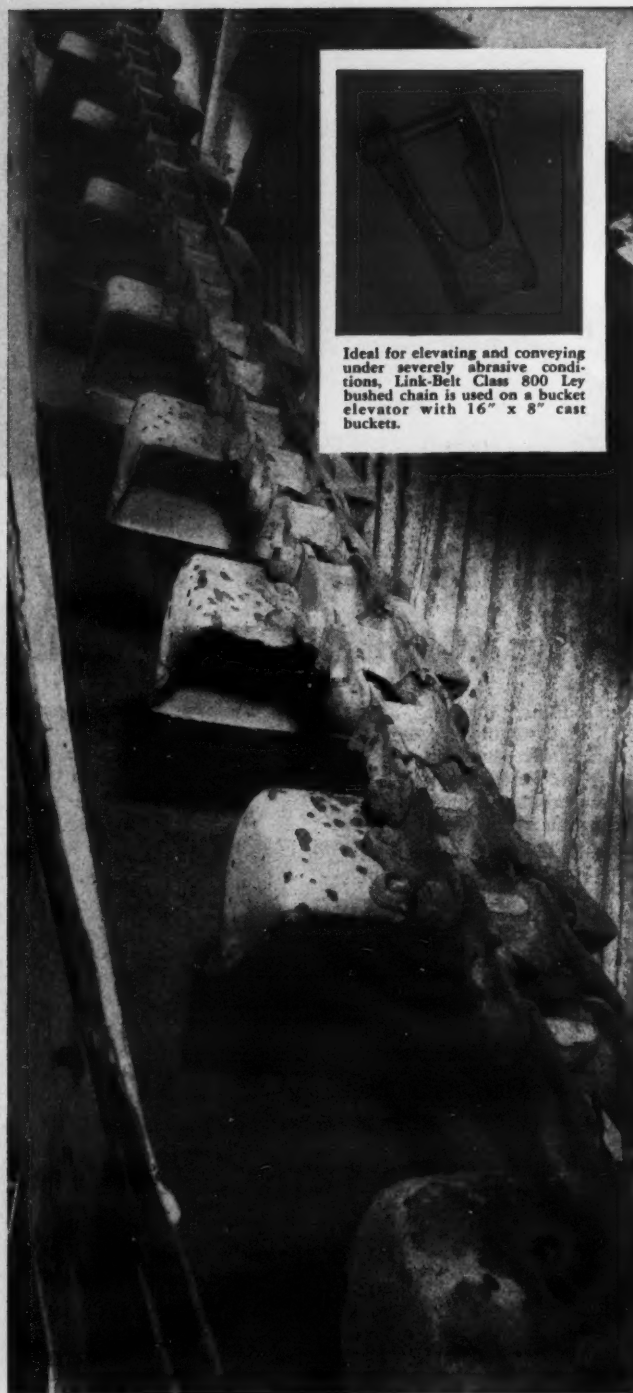
Name \_\_\_\_\_

Company \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

# Here's a chain designed specifically for abrasive elevator-conveyor service



Ideal for elevating and conveying under severely abrasive conditions, Link-Belt Class 800 Ley bushed chain is used on a bucket elevator with 16" x 8" cast buckets.

## It's long-life LINK-BELT Ley bushed chain that assures less downtime

If you're handling abrasive materials, you'll appreciate the extra wear Link-Belt builds into its Ley bushed chain. The barrels of this rugged cast chain have renewable hardened steel bushings in which steel pins ride. For extraordinarily severe service, manganese steel bushings and alloy steel pins can be furnished.

The design and manufacturing refinements that go into the Ley bushed line are typical of the care that Link-Belt gives to every detail of every chain. And, because Link-Belt builds a complete line, you're sure to get the one best-suited to your exact requirements. Ask your Link-Belt representative or distributor for all the facts on Link-Belt chains and sprockets today.

No ONE chain serves every purpose—get the RIGHT one from LINK-BELT's complete line



LXS chains are made to close tolerances from carefully selected steels. Ideal for rugged drive and conveyor service.



Class C combination chain—popular, durable, low-cost design for elevators and conveyors.



Class SS bushed roller chain with straight sidebars—for practically any conveyor or elevator.



Link-Belt "Flint-Rim" cast sprockets give extra long life. Cast steel sprockets for most severe service.

# LINK-BELT

CHAINS & SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

## NEW SOLUTIONS of processing problems

### Resin is dewatered and metered by special valve in continuous ion exchange set-up . . .

unique design minimizes carry-over of solution, cuts attrition of resin

**Problem:** When Stanford Research Institute, Stanford, Calif., built its first experimental continuous moving-bed countercurrent ion exchange column, it used a water-operated venturi jet to transport and meter the resin. This method was not satisfactory because of the dilution from the water carrying the resin, even though improvements were tried to reduce this dilution.

Next step was use of a mechanical screw lift, but this was not satisfactory for two reasons: too much solution was carried along with the resin, and resin attrition rate was too high.

**Solution:** The Institute developed and built its own resin metering and dewatering valve. It is made largely of acrylic resin. Method of operation can be explained with aid of the accompanying drawing.

As rotor turns clockwise, here's what happens. With bore of rotor vertical, an aliquot of resin slurry flows into upper half of bore through inlet nipple. Resin is retained on perforated glass disc, and some of the solution drains through perforations to bottom outlet.

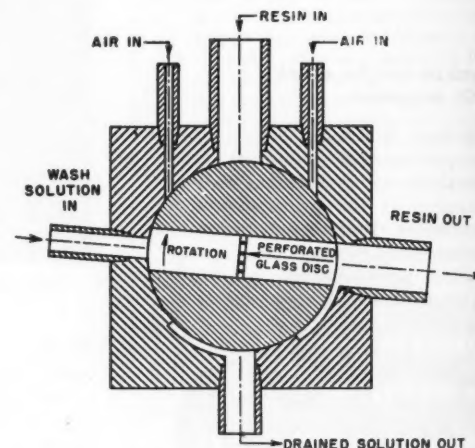


Diagram of resin metering and dewatering valve

As bore of rotor passes under right air inlet, air pressure is applied to this inlet by means of cam arrangement which actuates a solenoid air valve. Air forces residual interstitial solution out of the resin into the slot opposite and then out same bottom outlet. Just as bore passes beyond the right air inlet, the cam arrangement closes solenoid valve, thereby assuring that air won't leak around the rotor.

Bore next aligns itself with resin outlet and, at opposite end, with flush solution inlet. This solution, under a constant head, carries resin slug from valve as a slurry. Flushing operation leaves bore partially filled with washout solution, which

When inquiring check CP 8135 on handy form, pgs. 2-3

CHEMICAL PROCESSING



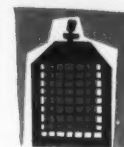
it pays to see **VICTOR**



## OXALIC ACID

Oxalic acid is a brilliant, transparent, colorless, crystalline material.

**USES:** Radiator cleaning compounds. Leather processing. Bleaching of straw, wood and cotton linters. Laundry sour for discharging bleach and removing iron stains. Washing coal. Removing rust stains from marble. Manufacture of metal polishes, blueprints, dyes, bluing. Purifying compound and precipitating agent. Analytical reagent. Reclaiming colored candles. Ink and rust remover. Purifying rosin. Cleaning railroad cars.



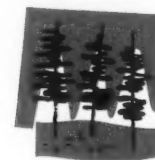
## Remedy for Rusty Pipes

In automobile radiators, steel, hot water and air combine to produce rust and scale. Both are undesirable . . . particularly when they interfere with the cooling function of an automobile radiator. Nothing equals the ability of oxalic acid in keeping radiators clean and rust-free. Victor oxalic acid is one of the principal components of most nationally-known brands of auto radiator cleaners. It pays to see Victor.

## SODIUM TRIPOLYPHOSPHATE

Sodium tripolyphosphate anhydrous, powdered or granular.

**USES:** Soap builder. Manufacture of detergents and water softeners. Purification of china clay. Conditioning oil drilling muds. Particularly effective in bar soaps; will not crystallize nor bloom. Disperses soap curds in hard water and eliminates scum. Clay dispersant. Deflocculant in raw cement slurries. Anti-pitch agent in paper making.



## Wild Pitch Causes Loss

Paper making is a multi-million dollar industry in which phosphates play an important role. For example . . . Victor sodium tripolyphosphate and tetrasodium polyphosphate are used to remove wood tar or "pitch" from raw pulp that would cause "downgrading" if it were not taken out. In addition, Victor sodium phosphates are used to control water hardness. This prevents clogging of equipment and permits a better blending of water with pulp. Send for Technical Service Bulletin V1-52. It pays to see Victor.

## DISODIUM PHOSPHATE, ANHYDROUS

Anhydrous disodium phosphate is a white, crystalline material of food grade purity. Also available, disodium phosphate duohydrate, a white, crystalline material which complies with Food and Drug Laws in purity.

**USES:** Boiler water treatment. Tin weighting of silk. Textile process waters. Buffer in dye-baths. Casein emulsifier. Processing of cheese. Manufacture of pharmaceuticals, and evaporated milk. Pumping pickle for canned meats.



## Plug for Wisconsin

Children love it for lunch. Melted, it makes a tasty sandwich. Blended, it makes a splendid sauce. *It's delicious process cheese.* To give process cheese its smooth, creamy texture, cheesemakers call for Victor's disodium phosphate. Without it, process cheese would be crumbly and unappetizing in appearance. With it, process cheese sales have had a steady, healthy growth. It pays to see Victor.



## FORMIC ACID

Formic acid is a fuming, colorless, corrosive liquid that evaporates completely on exposure to the air. It has a characteristic pungent, penetrating odor, and is milder than muriatic or sulphuric acid; considerably more active than acetic acid.

**USES:** Tanning. Acidifying dye-baths. Sourcing in laundries. Plating baths. Manufacturing formates, fumigants, insecticides, pharmaceuticals, antibiotics, refrigerants, solvents for perfumes, and lacquers. Wire stripping compounds.



## Never Underestimate the Power of a Woman

By and large, men dye for women. The constant search for new colors and shades rests largely on the female fashion whim. Finding color variations is relatively simple. Matching these shades in various textiles and weaves is another story. Victor formic acid, diammonium phosphate, and other phosphates help dyers do their job faster, more accurately and with a minimum of risk. New applications for the textile industry are in the process of development. Write for details.

## SURFACE-ACTIVE PHOSPHORUS COMPOUNDS

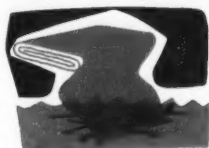
**Victawet® 35B.** Anionic. 70% paste. Soluble in water. Sparingly soluble in alcohol. Non-foaming.

**Victawet® 58B.** Anionic. 70% paste. Soluble in water. Sparingly soluble in alcohol. Used where clear water solution and small amounts of foam are desirable.

**Victawet® 12.** Non-ionic. 100% active liquid. Soluble in alcohols. Insoluble in naphtha. Milky solution in water. Non-foaming.

**Victamines C & D.**

(U. S. Pat. 2406423) Cationic. 100% active. Disperses in water. Soluble in alcohols, ether, kerosene, toluene.



## Wetter Water Works Wonders

Reducing the surface tension of water increases the ability to penetrate, spread or "soak." In metal cleaning, for example, the use of a Victor wetting agent in the cleaning solution assures a more rapid, more thorough coverage of the surface to be cleaned. Faster cleaning and better cleaning often results. Many industries such as the textile, paper, detergent, laundry and chemical industries have found profitable use of such Victor wetting agents as Victawet 35B, 58B, 12 or Victamines C and D. It pays to see Victor.

## ALUMINUM FORMATE

Aluminum formate, basic (solution), U. S. Pat. 2154170, is a colorless solution containing 8.5% aluminum oxide ( $Al_2O_3$ ), and mildly acid in reaction.

Specific gravity of 1.15-1.19° Baumé

**USES:** Waterproofing. Mordanting. Anti-perspirant compounds.

## Solution for Stormy Weather

Ever wonder why a trench coat stays dry inside when it's raining "cats and dogs" outside? Victor aluminum formate provides part of the answer. Combined with waxes and other ingredients, aluminum formate makes a water-repellent coating for textiles and paper.

**VICTOR**  
*Dependable Name in*  
*Chemicals*  
for 56 Years

## PHOSPHORIC ACID

Phosphoric acid is a clear, colorless, sparkling liquid. All grades meet the requirements of the Federal and State Pure Food Laws.

Concentrations: 75%, 80%, 85% N.F.  
115% (Polyphosphoric)

**USES:** Manufacture of yeast, sugar, soft drinks, imitation jellies, gelatin, and pharmaceuticals. Rustproofing, engraving, railroad car cleaning, refining oil and gasoline, preserving silage. Weighting silk, and dyeing textiles. Chemical polishing and electro-polishing metals, bright-dip baths for aluminum. Manufacture of phosphates, dental cements, glue, ceramics, glass, metal treating compounds, explosives, and fertilizers.



## Start of a Beautiful Finish

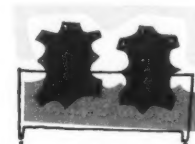
Victor phosphoric acid is giving many companies a brighter look on profits. Chemical or electro-polishing baths containing phosphoric acid are replacing mechanical buffing for the finishing of products made of stainless steel, aluminum and other metals which can be given a bright, shiny finish (inside and out) in a few minutes. Here is another example of how Victor helps industry find faster, lower cost or better production methods. It pays to see Victor.

## SODIUM FORMATE

**TRADE MARK — Protan®**

Protan® sodium formate is a white, odorless powder, soluble in water.

**USES:** Chrome tanning. Neutralization of leather. Wallpaper printing. Plating baths. Reducing agent. Blueprint developer. Neutralizer for carbonized wool.



## Tanning Takes Time

Speeding tanning time interests every leather tanner. Victor sodium formate helps turn the trick. When sodium formate is added to chrome tanning solutions, the chrome liquors are stabilized, and rapid, uniform penetration of the leather takes place. Fixation is increased and more chrome is exhausted from the solution. In addition to other advantages, leather is produced with greater smoothness and fullness. Sodium formate is the most effective of the chrome tanning masking agents. Further proof that it pays to see Victor.

## plants and offices of VICTOR CHEMICALS



it pays to see

**VICTOR**

Dependable Name in  
*Chemicals*  
for 56 Years

## VICTOR CHEMICAL WORKS

141 West Jackson Boulevard  
Chicago 4, Illinois

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## NEW SOLUTIONS of processing problems

is displaced when bore aligns with left air inlet, to which air flow is also controlled by cam arrangement. This surge of air blows residual solution from bore into slot opposite air inlet, and then out same slurry outlet.

Thus, one cycle is completed, next operation being filling of "new" upper half of rotor bore. Therefore, there are two complete cycles per revolution of rotor.

**Results:** Performance of valve has been evaluated thoroughly. No measurable carry-over of solution has been found, other than what the filtered resin would normally carry.

(Information supplied by Stanford Research Institute, Stanford, California.)

### Product purity and equipment protected by permanent pulley magnets . . .

Wilson & Co. utilizes units in processing of animal feed

**Problem:** At Wilson & Co. in Chicago, expeller units are used for recovering fat from dry rendered tankage in the processing of manufacturer's Red W meat scrap. These expellers literally squeeze out the grease. At this point in the process, electromagnets

were formerly used to prevent the possibility of iron entering product or damaging machinery. However, these belt type units were not entirely dependable. It was not always easy to tell if they were actually operating.

Also DC current

was required at some points where only AC was available, making the addition of a rectifier necessary. In addition, some maintenance was also necessary.

**Solution:** Approximately five years ago, permanent non-electric magnetic pulleys were acquired and placed in operation at the expellers. These units require no outside source of current.

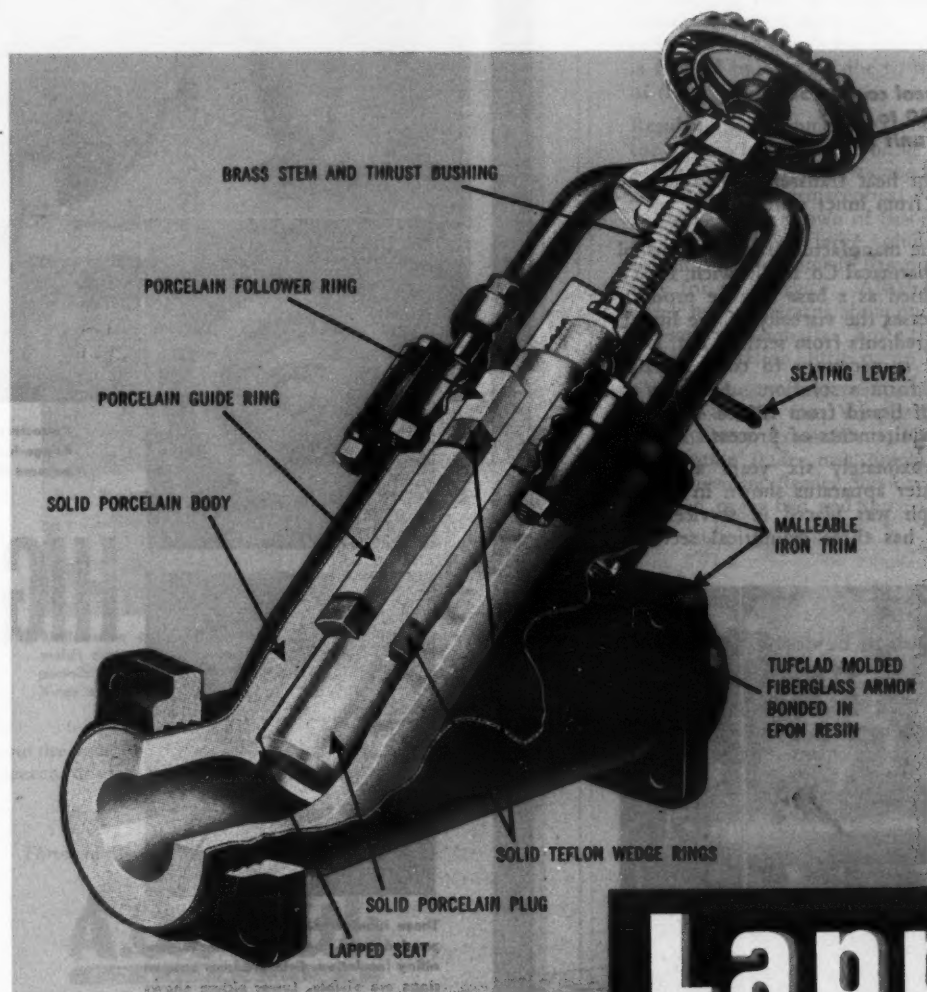
**Results:** Permanent non-electric magnetic pulleys have been found to do a foolproof job of protecting the purity of the product and preventing damage to equipment. They have been practically maintenance-free and cost of operation is very low.

(Permanent non-electric magnetic pulleys are product of Eriez Mfg. Co., Dept. CP, Erie 6, Pa. . . . check CP 8136 on handy form, pages 2 and 3.)

For more information on product at left, specify CP 8137 . . . see information request blank between pages 2 and 3.

## A "cushioned" porcelain-to-porcelain seal in the Lapp Valve

The chemical resistance qualities of the Lapp Valve come from the fact that the body and plug are both *solid porcelain*. Porcelain, as a material, however, has little resiliency or "give" when the plug hits the seat in the body. Special spring-loaded "cushion" seating in Lapp valves prevents damage from a heavy-handed operator, and warns when seal is tight. Built into the thrust bushing of every Lapp Y-valve and angle valve, is an arrangement of tempered Beryllium copper spring washers. This spring loading also provides that a closed valve will maintain its tightness even under vibration and thermal movement of parts.



# Lapp

## PROCESS EQUIPMENT

Chemical Porcelain Valves • Pipe • Raschig Rings  
Pulsafeeder Chemical Proportioning Pumps

V-valves, angle valves, flush valves, safety valves, and plug cocks of Lapp Porcelain have standard bolt-circle flanges for easy connection to all piping and equipment. Write for bulletin with complete description, characteristics, and specifications, Lapp Insulator Co., Inc., Process Equipment Division, 317 Wendell St., LeRoy, N. Y.

When inquiring check CP 8138 on handy form, pgs. 2-3

**Fuels can be switched easily  
in modern boiler plant**

Eight-page bulletin outlines boiler plant at \$8 million A. B. Dick plant in Niles, Illinois. Plant can use either coal or gas for fuel. Switching fuels during different seasons has resulted in high efficiency ratings — 73% in winter, and 71% during summer.

Photographs show boilers, equipment, and combustion controls. Diagram indicates placing of controls. Capacities, load conditions, fuel and ash handling are discussed.

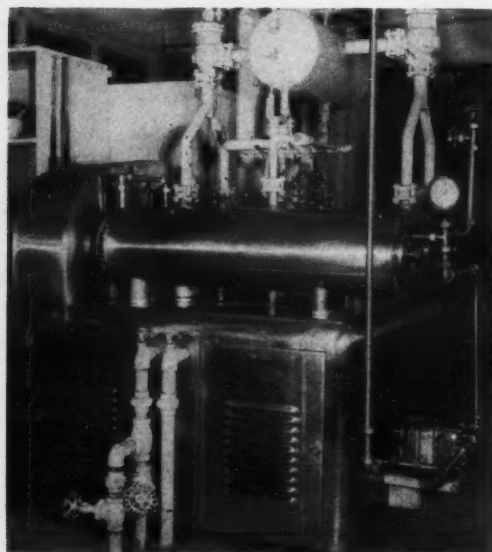
Bul R-9 is issued by The Hays Corporation, Dept. CP, Michigan City, Indiana. When inquiring specify CP 8139, pages 2 and 3.

**Norwich Pharmacal cools 250 gph  
of liquid from 180 to 40°F  
with exchanger unit . . .**

highly efficient heat transfer is obtained by scraping film from inner wall

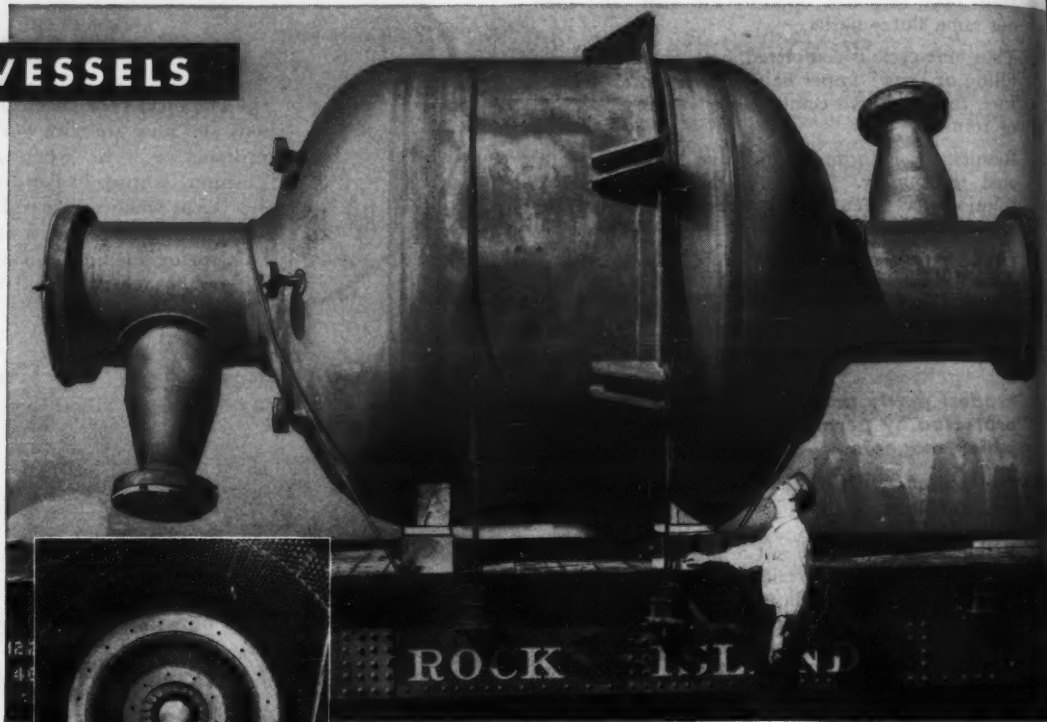
**Problem:** In the manufacture of Pepto-Bismol at The Norwich Pharmacal Co. in Norwich, N. Y., a gel solution is used as a base for the product. This solution increases the viscosity of the liquid, preventing the ingredients from settling out. During processing, it is necessary to cool a water slurry in order to form a solution. A means of cooling 250 gph of liquid from 180 to 40°F was needed to meet requirements of process.

**Solution:** Approximately six years ago, the Votator heat transfer apparatus shown in accompanying photograph was placed in service. As can be seen, unit has three cylindrical sections.

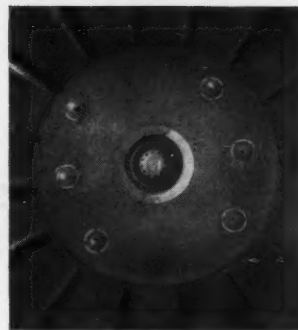
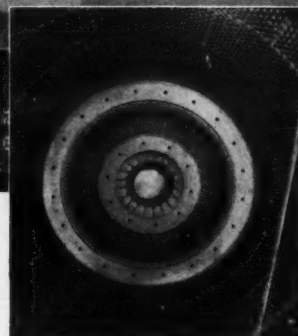


Heat transfer apparatus cools mixture of water and inversely soluble ingredient to form a solution

**VESSELS**



Refractory-lined reactor ready for shipment from the Milwaukee plant. Overall length flange-face to flange-face: 21 ft. 7 in. Three of these A. O. Smith reactors, when installed, become the heart of a catalytic reforming plant.



These interior views show, at top: expanded metal liner support prior to gunning insulation. Grid platform support rings are visible. Lower picture shows shop-installed refractory lining covered by stainless steel lining designed with interlocking expansion joints.

# HIGH TEMPERATURE HIGH

A. O. Smith lined and tubula

For thirty years, petroleum and chemical industries have come to us with pressure vessel and heat exchanger problems. Their reliance on the unmatched advantages we offer in manufacturing know-how and the resourcefulness of our research laboratories and technicians, design engineers and shop men has proved to be well placed. The two reactors shown here are examples of our work.

On this page is a special, refractory-lined vessel of A-212 steel, designed for 650 psi. and temperatures starting at 900° F. The walls are protected by shop-installed refractory lining. Total weight of 50 tons includes 28,000 lb. of lining, its supports

Shown here is  
changer shop,  
inch wall tubes  
all poly reactor

and a

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# for Outstanding Advantages

## EXCHANGERS



Shown here is one of twenty poly reactors going through our heat exchanger shop, undergoing tube side pressure test at 2160 psi. One-quarter inch wall tubes are welded to tube sheets and tubes rolled full depth on all poly reactors.

## RE HIGH PRESSURE

and tubular reactors

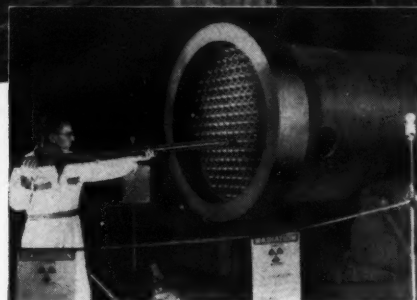
and a catalyst grid platform on pedestal rings.

On this page is shown a poly reactor undergoing shop tests before shipment. Throughout fabrication and long before shop work begins, materials and processes are subjected to exhaustive tests to make sure quality demands are met. Metallurgical, spectrographic and pressure tests during and at completion of construction assure conformity to specifications.

### YOU ARE INVITED

Whenever you have a pressure vessel or exchanger problem, write our Milwaukee office for information

For glass-lined process equipment, contact GLASCOTE PRODUCTS, INC., Cleveland 17, Ohio—A new A. O. Smith Subsidiary



Radioactive cobalt being used for examination of welds during poly reactor construction. This method permits examining welds that are inaccessible to X-ray equipment.

about the outstanding advantages which A. O. Smith research, engineering and construction offer.

Through research  ... a better way

**A.O. Smith**  
CORPORATION

Process Equipment Division  
International Division: Milwaukee 1  
MILWAUKEE • HOUSTON • LOS ANGELES

When inquiring check CP 8140 on handy form, pgs. 2-3

## NEW SOLUTIONS of processing problems

Each section consists of a narrow annulus through which the product is conducted and an outer annular passage through which heat transfer medium flows.

Scraper blades within the product annulus, attached to a center rotating shaft, remove product from heat transfer surface continuously and transfer it back into body of material. This exposes a freshly scraped surface, which is immediately contacted by more of the material that is to be heated or cooled. Scraped surface is responsible for the high efficiency of heat transfer. Unit has 18 sq ft of heat exchange surface.

In the equipment at Norwich, 50°F well water is used as the cooling medium in the first cylinder. In the second and third cylinders, Freon is used for cooling, the gas being compressed to a liquid before it enters apparatus. In this process the mixture enters apparatus as a slurry and a solution is formed by cooling due to the inverse solubility of the ingredient.

**Results:** Equipment has been found to meet the requirements for cooling 250 gph of liquid between the temperatures specified. According to the Supt. of Pharmaceutical Mfg., this apparatus is the only one known of this size that will handle this comparatively large volume of liquid in such a manner. Equipment has proven to be satisfactory for this service. All that is necessary is to check over apparatus about once a week and change the seals occasionally. Since this is largely a push-button operation, little or no labor is involved.

(Votator heat transfer apparatus is manufactured by The Girdler Co., Votator Div., Dept. CP, 224 E. Broadway, Louisville 1, Ky. . . . or for more information reader may simply check CP 8141 on the convenient Reader Service slip which is located between pages two and three.)

### Interesting unsolved problems summarized in booklet

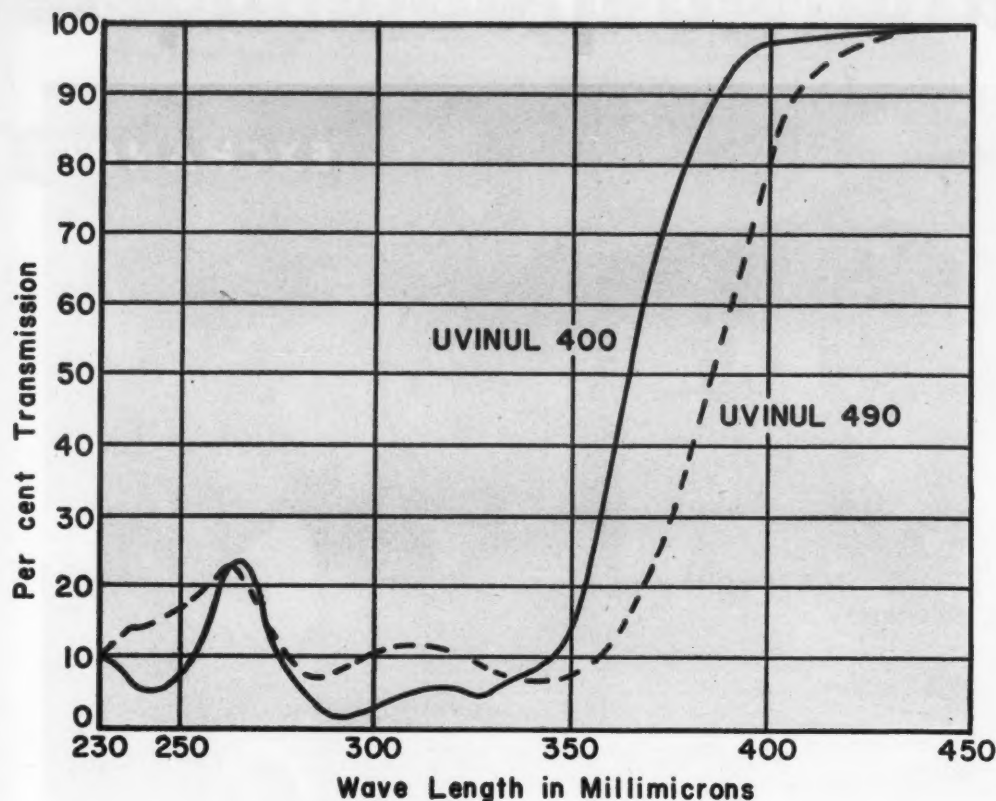
Intended to stimulate studies of those properties of materials concerning which information is needed, 24-page booklet summarizes interesting unsolved problems.

All of these problems are presented in the same style: title and presentation of problem, present state of knowledge, questions that need to be answered, and introductory references. Introductory references include a paragraph indicating to whom requests for additional information should be directed with respect to that particular problem.

Problems discussed range from those dealing with corrosion to those on material fatigue.

"Some Unsolved Problems" is available from American Society for Testing Materials, Dept. CP, 1916 Race Street, Philadelphia 3, Pa. When inquiring specify CP 8142 on the convenient Reader Service slip which is located between pages two and three.)

*absorbs  
ultraviolet  
radiation*



Absorption Characteristics of Uvinuls 400 and 490. Concentration: 2.50 mg/100 cc methyl alcohol

*finds use in protective films  
and as UV stabilizer for plastics*

**Two compounds offer means of controlling harmful effects of ultraviolet radiations**

**Uses:** Compounds will protect materials that are subject to discoloration or deterioration of properties when exposed to ultraviolet radiation. They may also be used to control photochemical reactions. These effects can be accomplished within the system containing the absorbing compounds or in a substrate shadowed by a protective coating or film.

Absorbers can be used in aqueous or non-aqueous media such as waxes, creams, or aerosols. They

can also be combined into permanent resin finishes.

**Features:** Ultraviolet absorbing range is from the far UV, 200 millimicrons, to the threshold of visible light, 400  $\mu$ . Absorbing compounds not only can be used to protect a substrate, but are also effective when incorporated directly into many transparent and translucent plastics.

When formulated properly, absorbers are stable to both UV and visible light. They can be stored indefinitely.

**Description:** Chemically, Uvinuls are substituted benzophenones. They are supplied in powder form having an activity of approximately 100%, the only impurities being traces of inorganic salts. Uvinul 400 is recommended for use where a colorless absorber is required. Uvinul 490 imparts a slightly yellow cast, but is a more efficient absorber (see absorption characteristics curves in chart above).

Compounds are compatible at effective use-concentrations in all commercially available plastics, other than polyethylene and rubber hydrochloride. Standard mixing techniques can be used, since compounds will not be adversely affected by temperatures as high as 240°C held for 30 minutes.

When absorbers are used in protective films, it is preferable to use a low concentration of Uvinul and a thicker film, rather than a higher concentration in a very thin film. As the concentration of the absorbers is increased, the range of UV absorption is extended toward the visible spectrum.

**Uvinul Solubilities**  
(per cent by weight)

Solvent	Uvinul 400	Uvinul 490
Ethyl alcohol	40	3
Ethyl acetate	30	35
Methyl ethyl ketone	45	40
Toluene	<1	<1

Uvinuls are insoluble in water and in most hydrocarbons



### Absorption Characteristics of Uvinuls

Radiant energy incident on a transparent body is partly reflected, partly absorbed, and partly transmitted. The small and constant effect of reflectance can be ignored when considering the relation between transmission and absorption, given by the equation:

$$(\% \text{ transmission}) = 100 - \% (\text{total absorbance of medium} + \text{Uvinul})$$

The data for the accompanying curves were obtained from a one cm quartz cell in Beckman Model DU Spectrophotometer. Medium is methyl alcohol, which does not absorb UV appreciably and so has a negligible effect.

(Uvinuls 400 and 490 are developments of Antara Chemicals, a sales division of General Aniline and Film Corporation, Dept. CP, 435 Hudson St., New York 14, N. Y. . . . or for more information check CP 8143 on handy form, pages 2 and 3.)

### Reinforcing filler for rubber products imparts good physical properties and permits pigmentation . . .

zinc thiolignate can be made from by-product of paper pulp manufacture

Rubber compounds formulated with filler, made from paper pulp by-products, have tensiles in range of 3700 psi, with elongations of 580%. Not only do cured compounds show good tear and abrasion resistance and good aging characteristics, but they can be pigmented to almost any shade. Such is the unusual combination of properties of zinc thiolignate, a by-product of paper pulp manufacture by sulfate or soda process.

Zinc thiolignate is readily mixed with both natural and synthetic rubbers. Acting to digest rubber during processing, filler can be used at heavy loadings. Although not pure white, reinforcing material has low tinting power and permits coloring of formulations. Filler will not inhibit acceleration or contribute to hysteresis loss. Sp gr is 1.6.

Experimental automobile tires have been produced in red, green, and brown colors. When tested, these tires compared favorably with conventional black sidewalls.

Reinforcing filler is made as follows. Lignin is separated from waste liquor of the sulfate or soda process paper pulp digester, using  $\text{H}_2\text{SO}_4$ ,  $\text{CO}_2$ , and other chemicals. Zinc thiolignate is made from the lignin by a special method. After filtering, washing, drying, and pulverizing, the filler has a 0.05 to 0.5 micron particle size. Economics of the process are said to be very favorable.

(Zinc thiolignate was developed at Kobe University, Kobe, Japan, and is covered by Japanese Patent No. 186,721.)

## INQUIRE ABOUT

# Oronite POLYBUTENES

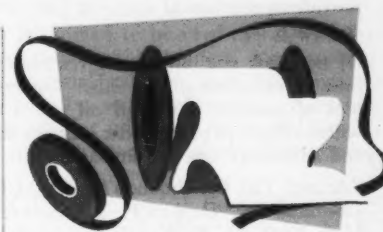
## for superior calking and sealing compounds



The non-drying properties of Oronite Polybutenes make them useful in conjunction with oils and fillers in permanently pliable sealing compounds. Their low temperature flexibility characteristic makes them ideally suited as binders in both knife grade and gun grade types of calking compounds, or the related sealing, insulation or sound deadening mastics. Being competitive in cost with most blown vegetable oils, a proper balance of fillers, oil and Oronite Polybutene can provide most any desired characteristic. Being natural moisture barriers they improve the water resistance of crack-sealing compounds. Write any Oronite office for complete information.

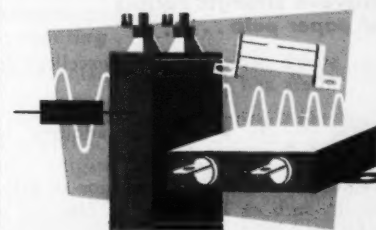
### ORONITE CHEMICAL COMPANY

38 Sansome St., San Francisco 4, Calif. • 714 W. Olympic Blvd., Los Angeles 13, Calif.  
30 Rockefeller Plaza, New York 20, N. Y. • 400 S. Michigan Ave., Chicago 5, Ill.  
Mercantile Securities Building, Dallas 1, Texas



### ADHESIVES

Easily incorporated into rubber base stock, either by milling or solvent pick up, Oronite Polybutenes have a wide acceptance in the formulation of pressure sensitive adhesives, industrial tape, surgical tape masses, colorless label adhesives and cements.



### ELECTRICAL INSULATION

Oronite Polybutenes offer superior dielectric strength, low expansion coefficient and low power factors—all essential in paper-insulated electrical products. Their low power factor values, over a wide frequency range, make them useful as a dielectric in condensers and capacitors. Stability of this power factor is maintained over long periods of time.

### OTHER ORONITE PRODUCTS

Detergent Alkane	Phenol
Detergent Slurry	Naphthalenic Acids
Detergent D-40	Phthalic Anhydride
Detergent D-60	Maleic Anhydride
Dispersant NI-O	Pure-Xylene 95%
Dispersant NI-W	Oronite-Xylene
Wetting Agents	Xylol
Creylic Acids	Aliphatic Acid
Gas Odorants	Acetone
Lubricating Oil Additives	Hydroformer Catalyst
Sodium Sulfonates	Dispersant FO
Purified Sulfonate	(Furnace Oil Inhibitor)



2876

When inquiring check CP 8144 on handy form, pgs. 2-3

## MATERIALS

### Describes tall oil products in detail

Booklet of 46 pages describes in detail manufacturer's line of tall oil products. These oils are obtained from the sulfite (or Kraft) paper process, and find application in paint and varnish, soap, chemical, and paper industries, where they provide an economical source of fatty acids, rosins, and pitch.

Of notebook size, brochure gives history and outlines manufacture of the oils. Composition and uses of manufacturer's tall oil products are presented. Eight-page appendix includes test methods and additional data in summary form.

"Acintol Tall Oil Products" is issued by Arizona Chemical Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. When inquiring specify CP 8145 on handy form, pages 2 and 3.

### Low concentrations of chemical improve strength factors of paper pulp . . .

starch derivative gives excellent retention of fillers and pigments

**Uses:** As a headbox additive to improve strength factors of paper.

**Features:** Excellent retention of fillers and pigments, such as  $TiO_2$ , can be obtained with use of additive. Material is also effective in improving strength factors, such as mullen, fold, tensile, and pick, at low concentrations on different types of pulp.

**Description:** Additive is based on a cationic starch derivative. Called Cato Starch, the material improves sheet formation and produces good drainage on paper machine wire. This allows machine speed to be increased without a loss in sheet strength.

(Starch additive is a development of National Starch Products, Dept. CP, 270 Madison Ave., New York 16, N. Y. . . or for more information check CP 8146 on handy form, pages 2 and 3.)

### Nonionic leveling agents and dyeing assistants made available . . .

products are polyoxyethylated fatty alcohols

Three additional dyeing assistants are being offered to the textile industry. All clear, viscous liquids, products are nonionic polyoxyethylated fatty alcohols, individually described as follows:

**Rexan O** gives level dyeing and penetration with direct, basic, and vat dyestuffs on all fibers except wool. It is also an effective stripping agent for many vat colors. Agent is said to have good wet-



### Arquad® 12 in latex foam

Armour's Arquads (quaternary ammonium compounds) are being used effectively for their anti-static, emulsifying, cationic softening, germicidal and detergent properties. Recently, Arquad 12 has proved to be an efficient and economical gel sensitizer and processing aid in natural and GR-S latex foam compounds.

The effectiveness of Arquad 12 is demonstrated in controlling the rate of gelation in the formation of the sponge. Compared to gelation without a sensitizer, Arquad 12 enables the latex to gel at a higher pH and to gel more rapidly, thus reducing shrinkage and affording a better structure and a firmer gel. This results in better yields and a higher quality sponge.

Another advantage of Arquad 12 is that the rate of gelation can be varied depending on the amount used. The quantity of Arquad 12 required is small—using it with a soap made from a low-priced fatty acid such as Neo-Fat® 42-12 gives a double cost advantage. Arquads can also be added to the finished foam compound before frothing so that greater control can be obtained from batch to batch.



Latex foam stabilized by Arquad 12 (at left) gelled in 4-5 minutes, showed good strength. Identical formula without Arquad 12 gelled in 8-9 minutes, and foam collapsed.

© ARMOUR AND COMPANY



## ARMOUR CHEMICALS STIMULATE NEW DISCOVERIES IN LATEX FOAM. SECONDARY OIL PRODUCTION WAX COATINGS!

By Dr. M. R. McCorkle, Technical Director,  
Armour Chemical Division

### Arquad T-2C in oil systems

Armour Petroleum Chemists have developed another new Arquad for preventing corrosion and bacteria growth in secondary oil recovery systems! This new product, Arquad T-2C, is a mixture of tallow trimethyl ammonium chloride and di-coco dimethyl ammonium chloride.

Petroleum producers who have tested and adopted Arquad T-2C in their water flooding operations report a minimum of 95% corrosion protection (in some cases 99.5%) and complete control of sulphate reducers. Arquad T-2C means less plugging of sands and less down time for filter cleaning. And Arquad T-2C is extremely economical as a corrosion inhibitor—only 6 ppm is needed to do the job.

### Arquad S in cooling systems

Arquad S, Armour's soya trimethyl ammonium chloride, is excellent for reducing algae growth in water. This is especially effective in cooling water systems and heavy water-cooled equipment such as steel mill rolls, rubber machinery, etc.

## NEW COATING APPLICATIONS FOR ARMID® O

Armid O, a new member of Armour's group of amides derived from fatty acids, has shown interesting compatibility with waxes and plastics. Experiments have indicated that Armid O is an excellent release agent for polyethylene. New uses for this material are developing rapidly.

Armid O is recommended for use in the back-coating of adhesive tape as an anti-tack agent for better handling of the tape. Experiments show possibilities of using Armid O as a release agent in a nitro-cellulose backing on adhesive tape rolls. In paper coating formulations, Armid O has been effective as a methyl violet solvent.

Another new use for Armid O is in protective coating for electrical contacts. Armid O can be used as a coating for various phenolic resin electronic leads and couples which are coated with metal alloys to permit better conductivity. The film of Armid O coats out of the solvent (trichloroethylene) in a continuous film.

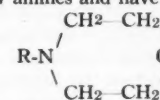
In the wet waxing of paper, Armid O is very desirable as a modifier to enhance the "slip" and transparency of the finished paper. It also provides low temperature flexibility to wax paper wrappings.

Mail the coupon today for free samples of Armid O, Arquads T-2C, S, and 12, and booklets containing more information on Armour's Armids and Arquads.



### ALKYL MORPHOLINES

The Armour Chemical Division announces two new cyclic tertiary amines now available in developmental quantities. They are the N-alkyl morpholines derived from coco or tallow amines and have the structure:



where R—either coco or tallow.

These new surface-active chemicals exhibit some interesting solubility characteristics for use in the wax, paper and textile industries. Both are soluble (1 gm./l. gm solvent) at room temperature in acetone, benzene, isopropanol, tetrachloroethylene, mineral oil, VM and P naphtha and ethyl acetate. Send for samples.



Armour's group  
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## STABLE, LIGHT COLOR DOUBLE PRESSED STEARIC ACID AVAILABLE IN ARMOUR'S NEO-FAT 18-54



In using double pressed stearic in the formulation of soaps, shampoos, cosmetics and shaving creams, freedom from yellowing and rancidity are extremely important—perhaps more important than any other characteristic. In Neo-Fat 18-54, Armour has developed a double pressed type stearic which, according to all heat stability tests, is the finest material available.

Storage time for the raw material, high temperature processing, shelf-life of the finished product—through all of these Neo-Fat 18-54 retains its good odor and light color, as do products made with it. Peroxide tests, which measure the amount of oxygen absorbed within a specific period of time, substantiate these claims. Tests after one year warehouse storage show no measurable peroxide value.

To manufacturers of buffing compounds, emulsifying agents, metallic stearates, and textile finishing agents, the stability of Neo-Fat 18-54 means not only longer shelf-life for their finished products but more uniform processing time. As a result, more production can be obtained without additional equipment.

Various heat stability tests were run on Neo-Fat 18-54 and four competitive double pressed stearic acids. The tests determined the degree of stability to rapid heating, moderate temperatures, extremely high temperature processing, and color stability in soap formulations. In all tests, Armour's Neo-Fat 18-54 proved markedly superior to competitive products.

Specifications include a titer of 53.9 to 54.4, iodine value of 7 max., acid value of 203 to 209, unsaponifiable content, 2.0% max., moisture 0.5% max., and color, Lov. 5 1/4" a max. of 1.0R-12Y. The average composition runs 46% stearic, 48% palmitic and 6% oleic acids.

Send for free samples and literature about this improved double pressed type stearic, available in 50-pound multiwall bags. Your own tests will convince you of its merit.

## SOAPS AND SHAMPOOS HEAD THE LIST OF MANY USES FOR ARMOUR'S QUALITY LAURIC ACID

Fractionally distilled coconut oil fatty acids, which have had the irritating short carbon chain fatty acids removed, provide an opportunity to increase the sale of soaps and shampoos. An outstanding example of this is Neo-Fat 12—a commercially pure (95%) lauric acid.

Here are two soap shampoo formulas which are extremely effective, easily compounded, and produce excellent suds with the use of Neo-Fat 12:

### Formula A

Neo-Fat 12.....14.0 lbs.  
Triethanolamine (10% excess).....10.4 lbs.  
Sequestering agent.....0.13  
Water (quantity sufficient to make 100 lbs.)

### Formula B

Neo-Fat 12.....16.8 lbs.  
Potassium Hydroxide  
(39° Baume).....11.5 lbs.  
Thickener.....1.0 to 2.0 lbs.  
Water (quantity sufficient to make 100 lbs.)

### OTHER APPLICATIONS

Neo-Fat 12 is also used in the preparation of synthetic detergents. Condensation products of Neo-Fat 12 and diethanolamine or monoethanolamine make excellent wetting agents, emulsifiers and suds stabilizers.

Organic esters find many applications. The mono-, di-, and triglycerides may be used in pharmaceutical preparations, textile, leather, brushless shaving creams and other products.

### Specifications

	Min.	Max.
Iodine.....	—	1.0
Acid Value.....	278	282
Titer (°C.).....	34	44
Color, Lovibond 5 1/4.....	—	1R-10Y
Unsaponifiable.....	—	0.2%
Moisture.....	—	0.2%

### Composition

Lauric Acid.....	95.0%
Myristic Acid.....	4.0%
Capric Acid.....	1.0%

### Solubility

Neo-Fat 12 is soluble (at 60°C.) in acetone, amyl acetate, benzol, butanol, carbon tetrachloride, dipentene, ethanol 95% and 100%, kerosene, methyl cellosolve, turpentine, V. M. & P. naphtha and xylol.

At 60°C., Neo-Fat 12 is compatible with alkyd resins, asphalt, beeswax, carnauba wax, ester gum, gum rosin, linseed oil, paraffin wax, petroleum pale oil and soybean oil.

## COMPLETE BOOKLETS ON DUOMEENS® AND COCO FATTY ACIDS

### DUOMEENS BOOKLET

Technical data on Duomeens, the trademark adopted by Armour to designate its new group of diamines, is presented in this booklet. The outstanding properties imparted by the Duomeens and their salts—strong surface activity, good oil solubility, two polar amino groups per molecule, and relative ease of reaction—make these compounds ideal for use in asphalt, paper, germicide, textile, plastics, rubber, petroleum, and other industries.

### COCONUT OIL FATTY ACIDS BOOKLET

The patented Armour fractional distillation process has made possible the separation of ordinary mixed coconut oil fatty acids into their pure components acids,

with concentrations of above 92%. This booklet lists information and new applications for these high purity coconut oil fatty acids. Send the coupon for both of these valuable, up-to-date booklets.



Send literature: ☐ Arquads Booklet ☐ Arquad 12 in Latex Foam  
☐ Armids Booklet ☐ Duomeens Booklet ☐ Coconut Oil Fatty Acids

Send samples: ☐ Arquad 12 ☐ Arquad T-2C ☐ Arquad S ☐ N-Coco Morpholine  
☐ N-Tallow Morpholine ☐ Armid O ☐ Neo-Fat 18-54 ☐ Neo-Fat 12

Name..... Title.....  
Firm.....  
Address.....  
City..... Zone..... State.....

When inquiring check CP 8147 on handy form, pgs. 2-3

## MATERIALS

ting properties, and eliminate use of glue in vat dyeing.

Dextrol Fast Salt M, for use with acid metallized dyestuffs on wool, reduces amount of H<sub>2</sub>SO<sub>4</sub> normally required. Dyeing time is also decreased, while medium and heavy colors are protected through fastness to perspiration, rubbing, and decatizing.

Telkanol O is claimed to be very useful with unions of wool and synthetic fibers, wool, cotton, and furs. Material exhibits high resistance to acids, alkalis, salts, and hard water. A strong dispersing action for oils and fats in acid liquors makes this product an excellent wool degreasing agent.

(Products of Dexter Chemical Corporation, Dept. CP, 819 Edgewater Road, New York 59, N. Y. . . . or for more information check CP 8148 on handy form, pages 2 and 3.)

### Clarity and color retention properties suit self-extinguishing resin to exterior sheeting . . .

properties maintained after 90 days at 150°C

Uses: In applications where clarity, light stability, color retention, and fire resistance are required, as in corrugated sheetings.

Features: Resin is self-extinguishing and durable on outdoor exposure. Self-extinguishing property is maintained even after ninety days at 150°C.

Description: Laminex Resin 4147 is a styrene-based polyester resin and can be used in much the same manner as typical non-self-extinguishing resins. Resin has the following average physical properties:

Viscosity (poises @ 25°C)	3.4-4.4
Gel time (SPI, min)	6.3
Peak exotherm (SPI, °C)	196
Time to peak exotherm (SPI, min)	9.5-10.5
Storage stability (@ 25°C, months)	3

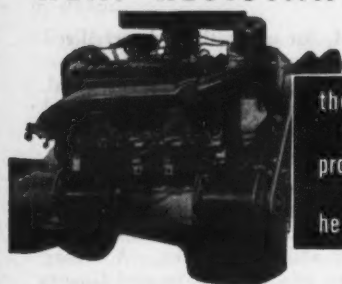
(Resin is a development of American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. . . . or for more information check CP 8149 on handy form, pages 2 and 3.)

### Line of polyester resins covered in 20 pages

Illustrated 20-page booklet provides a broad fund of information on line of Marco polyester resins and associated products. Properties and production technics with resins are given. Suggestions are made for additional applications which might be exploited.

"Marco Polyester Resins" is available from Celanese Corporation of America, Dept. CP, 180 Madison Ave., New York 16, N. Y. When inquiring specify CP 8150, pages 2 and 3.

*where Quality counts in a*  
**HEAT RESISTANT FINISH**



the manifold of the  
1954 Lincoln is  
protected by SICON  
Silicone Base  
heat resistant finish

● The Lincoln exhaust manifold is coated with SICON Black 7 x 933 to enhance and preserve its appearance. SICON maintained film integrity after subjection to a 24-hour heat test of 1000° F., substantially more severe than would be encountered under maximum operating conditions. This, plus a 10,000 mile road test, proved SICON to be the only finish suitable. SICON is so stable under heat that it is even used to protect critical parts of JET ENGINES! Available in Black, Aluminum, and Colors. Write for details...today!

# Sicon

MIDLAND Industrial Finishes Co.

EAST WATER ST., WAUKEGAN, ILLINOIS

ENAMELS • SYNTHETICS • LACQUERS • VARNISHES

When inquiring check CP 8151 on handy form, pgs. 2-3



## TOTRUST

INSTANT DRY METAL COAT  
INSTANT DRY ENAMEL

Can be applied to rusted\* or clean, new or old, damp or dry, painted or unpainted, interior or exterior, metal surfaces.

- Highly resistant to chemicals
- Extremely elastic
- Withstands temperature extremes
- Colors: Metal Coat — 8  
Enamel — 30
- Quick drying eliminates expensive plant shutdowns

\*Instant Dry Metal Coat recommended for first coat on rusted surfaces.



The Paint Selector Chart that enables you to immediately choose which paint products have all your important performance requirements — including cost — for each paint job.

Send for your copy today.

the WILBUR & WILLIAMS CO.

BOSTON BRANTFORD MASS

When inquiring check CP 8152 on handy form, pgs. 2-3

### Properties of Everflex G Emulsion

Total solids (%)	50-52
Viscosity (cps @ 25°C)	300-500
pH	4.0-6.5
Free monomer (%)	< 1
Average particle size (microns)	< 2
Particle charge	Negative

*Latex paint film  
resists water,  
yet is permeable  
to moisture vapor*

Polyvinyl acetate emulsion also gives long-lasting film flexibility with no addition of plasticizer during paint compounding

Uses: As an emulsion paint vehicle for interior and exterior use. Exterior application on masonry is feasible, and tests indicate this can be extended to the painting of wooden structures. Primer-sealer formulations can also be made.

Features: Emulsion has excellent resistance to water, yet dried film is semi-permeable to moisture which might otherwise remain trapped beneath, causing blisters or peeling.

In paint formulations, emulsion does not require addition of plasticizer to form a flexible film. This film is stable to oxygen, even in presence of metallic driers. Light stability, oil resistance, and aging characteristics are excellent.

Description: Everflex G is a plasticized polyvinyl acetate copolymer emulsion. It is white and has a characteristic mild odor. Emulsion has superior adhesive qualities. Physical properties are given in the accompanying table.

Recommended protective colloids are polyvinyl alcohol or methyl cellulose. Soya protein gives good viscosity stability. A non-ionic wetting

### materials

agent should be included in a formulation. Short oils should be used if modification with alkyds is necessary in special cases.

Calcium-base titanium pigments are to be avoided as they render film water-sensitive. Because pH is normally on the acid side, lithopones should be used with caution.

White paint formulation has excellent freeze-thaw stability, having survived ten 16 hr 0° to 75°F cycles without change. Storage stability is very good, pH tending to stabilize in 5.5-7.0 range.

### Dried Film Properties of Everflex G

Tensile strength (psi, after 2 weeks)	2000-2200
Elongation (% after 2 weeks)	500-900
Sp gr	1.17
Color	Water-white
Gloss	High
Clarity	Clear
Taste and odor	None
Melting range (°F, ball and ring)	> 390
Water absorption (% 24 hr @ 25°C and 100% RH)	0.7
Solvent extractable (% Soxhlet, 16 hr in boiling petroleum ether)	0.5

	Pounds
Titanox RA-50	275
Celite 281	70
Phenyl mercuric borate	0.1
Evanol 52-22 (10% aq sol)	40
R & R 551 interface modifier	10
Igepal CTA 639	4
Water	100

One quarter of the water is added first and mixed until a paste is formed. Remaining water is then stirred in and paste given one pass through a high speed stone mill. After transferring to a thinning tank, the following materials are incorporated.

Everflex G	432
Methocel (4000 vis., 4% aq sol)	75
Water	84
Total weight	1090.1

Yield is approximately 100 gal of latex paint having a viscosity of 70-75 K.U. and per cent total solids of 52.5.

(Everflex G is a development of Organic Chemicals Division, Dewey and Almy Chemical Co., Dept. CP, 62 Whittemore Ave., Cambridge 40, Mass. . . or for more information reader may simply check CP 8153 on handy convenient Reader Service slip which is located between pages 2 and 3.)



## Versatile styrene resin has high impact resistance

thermoplastic copolymer has good electrical and physical properties, can be pigmented to many colors

**Uses:** Resin can be calendered, injection molded, post-formed, or extruded to produce many products. By dissolving in ketones and esters, material offers potential as a protective coating and as a cast film material.

**Features:** Extremely versatile, resin possesses high impact strength, dimensional stability, has a high heat-distortion temperature. Resistance to oils, chemicals, and many solvents is excellent. Electrical and physical properties are good. Products can be machined, and will take a high gloss when solvent polished. Resin has good processing characteristics.

**Description:** Cyclocac is a resinous thermoplastic copolymer having a uniform molecular structure. Central ingredient is styrene. Material gradually softens when temp is raised above heat distortion point.

Cyclocac  
Physical Properties

Hardness (Rockwell)	R78-82
(Shore D)	72
Tensile (psi)	4100
Elongation (%)	100
Modulus of elasticity (tension, psi)	196,000
Compressive yield strength (psi)	5100
Flexural strength (psi)	6800
Sp gr	1.01
Heat-distortion temp (°F)	183
Brittle temp (°F)	-45
Flammability (inches/min)	1.30
Compression set under constant load (22 hr @ 158°F, %)	0.0
(70 hr @ 212°F, %)	66.5
Impact strength (Izod unnotched, ft pounds, @ -40°F)	36.0
(@ 73°F)	48.0
Dielectric strength (1/8" sample, volts/mil)	416
Power factor (60 c)	0.008
(10° c)	0.009
Dielectric constant (60 c)	2.71
(10° c)	2.93
Volume resistivity (ohm-cm)	8.2 x 10 <sup>13</sup>

Dilute acids, alcohols, oils, and alkali solutions produce insignificant changes. Esters, ketones, and ethylene dichloride are solvents. Samples of the material have withstood one year of outdoor weathering, with only a slight loss in elongation.

(Styrene copolymer is a development of Marbon Corp., a subsidiary of Borg-Warner Corp., Dept. CP, 310 S. Michigan Ave., Chicago 4, Ill. . . . or check CP 8154 on handy form, pages 2 and 3.)

## ONLY CARBIDE PRODUCES ALL THREE

You can order any one or all three of these low-boiling alcohols from CARBIDE. They are available in various specification grades to suit your requirements. CARBIDE's 25 years of experience in producing synthetic alcohols assures you of high-purity products. Tank-car and tank-truck shipments are readily made. Prompt LCL deliveries of most grades can be made from 50 warehouses in important industrial areas.

### WHENEVER YOU NEED AN ALCOHOL...

... check with CARBIDE — producers of 16 other synthetic alcohols. From this wide choice, you will be able to select the alcohol that has the combination of physical properties to solve your problem.

### For Technical Assistance

Call the nearest CARBIDE office for technical service — representatives are located in 21 principal cities across the nation. For additional information on these alcohols — their applications, physical and chemical properties, specifications and shipping data — ask for the new family book, "Alcohols" (F-4731). In Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.

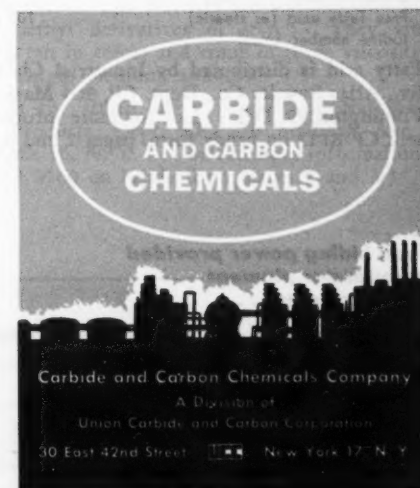
**methanol**

**ethanol**

**isopropanol**

These alcohols are most widely used as solvents and intermediates for —

- \* Surface Coatings
- \* Resins
- \* Dyestuffs
- \* Pharmaceuticals
- \* Cosmetics



When inquiring check CP 8155 on handy form, pgs. 2-3



**Details on ethylene oxide and ethylene glycols**

Ethylene oxide, ethylene glycol, and diethylene glycol are described fully in 33-page bulletin. Uses, chemical and physical properties, handling and storage features, and safety precautions are included. Behavior of each of the materials with other chemicals is portrayed by complete reaction formulas.

Complete analytical procedures to follow to determine color, odor, acidity, impurities, boiling range, and specific gravity for each chemical are given. Illustrative matter includes charts showing equipment for unloading tank cars and graphs pertaining to safety, humectant valves, dew points, vapor pressure, and other characteristics.

Bulletin on these three chemicals is issued by Nitrogen Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N. Y. When inquiring specify CP 8156 on handy form, pages 2 and 3.

**Saturated fatty acid resists darkening at high temp . . .**

material is palmitic/stearic acid combination

**Uses:** Should be of special interest to cosmetic producers.

**Features:** Fatty acid shows outstanding resistance to darkening, even at elevated temperatures.

**Description:** Hystrene T-45 is 55% palmitic acid, 45% stearic acid. Produced by patented Trendex solvent refining process, acid has following specifications:

Color (Lovibond, 5/4" cell, max)	2Y-0.4R
Acid number	205-209
Saponification number	206-210
Unsaponifiables (% max)	0.15
Free fatty acid (as stearic)	104-106
Iodine number (max)	0.5

(Fatty acid is distributed by Industrial Chemicals Div., Atlas Powder Co., Dept. CP, 904 Market St., Wilmington 99, Del. . . or for more information check CP 8157 on handy form, pages 2 and 3.)

**Good hiding power provided by extender pigment for latex paint . . .**

little difference is noted when vehicle is modified by alkyds or proteins

**Uses:** As an extender pigment for latex paints.

**Features:** With  $TiO_2$  alone, pigment can produce paints with hiding power equal to formulations containing higher percentages of  $TiO_2$  plus 20 or more per cent lithopone.

Modifying latex vehicle with alkyds or protein

# for your information...

brief summaries of helpful product news

## New Compound Developed by Monsanto Reduces Loss of Carotene in Alfalfa Meal

A promising new chemical has recently been developed for reducing the loss of carotene in dehydrated alfalfa meal during storage.

Carotene is an important constituent of the dehydrated alfalfa meal used in animal feeds because it is converted by the animal system to vitamin A, an essential growth and reproductive factor.

### Carotene Loss Cut

The new chemical which reduces carotene loss is called Santoquin\* and—at this time—is for use only on alfalfa going into poultry feeds.

Santoquin acts by slowing down the action of the oxygen on carotene. Laboratory and field tests have shown that the addition of only 0.3 of a pound of this compound to each ton of alfalfa meal may more than double the retention of carotene after six to eight months' storage.



Several advantages can be gained through the use of Santoquin.

First, a higher percentage of carotene can be preserved in alfalfa meal during warehousing, with a consequent upgrading in market

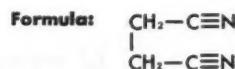
value. Second, a less expensive system of handling the rotation of dehydrated meal in storage can be used. Third, blending programs become simpler and dusting is reduced, thanks to the oil which is used as a carrier for Santoquin. This means better working conditions inside the mill and reduced meal losses from processing and handling.

Send coupon for complete information.



## Research Chemist's Corner

### SUCCINONITRILE

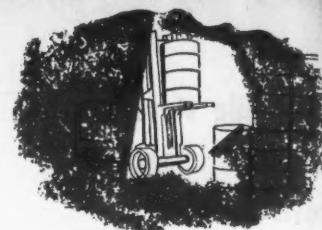


**Mol. Wt.**  
80

### Approximate Properties:

Appearance:	Waxy solid
Assay:	99+%
Odor:	None
Crystallization Point:	54° C. min.
Specific Gravity:	0.98 at 60° C.
Solubility in common solvents:	Slightly soluble in water, benzene and ethanol. Soluble in acetone, chloroform and dioxane.
Stability:	Succinonitrile has been held at 200° C. for 72 hours without appreciable decomposition.
Brief statement of chemical properties:	Will undergo the typical reactions of the nitrile group. Can be readily reduced in high yields to pyrrolidine. Liquid phase chlorination yields an interesting series of unsaturated chlorinated nitriles.

Experimental quantities available to qualified chemists.



## Methyl Toluene Sulfonate Available from Monsanto

Monsanto methyl toluene sulfonate is a mild methylating agent used primarily in the manufacture of pharmaceuticals and dyes. Its use can save the manufacturer time, since he receives a methylating agent without performing the step of esterification.

Shipped in 55-gallon drums, methyl toluene sulfonate has a limited toxicity and is relatively easy to handle. It does not require pressure reaction equipment because of its low volatility. More important, the M.T.S. end product of methylation reaction is an alkali metal salt of toluene sulfonic acid which is less corrosive than the strong acid salts of certain other agents.

For more information, send in the coupon today.

## Nontoxic Has Man

If you are...  
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you will...  
ticerizer\* 1

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## Nontoxic Plasticizer Has Many Applications

If you are searching for an effective plasticizer which can be used in vinyl film and sheeting, in packaging materials and adhesives, in plastisols and organosols, you will want to investigate Santicizer\* 141.

This compound has an extremely valuable feature: it is nontoxic. After being subjected to exhaustive toxicity studies covering more than three years, Santicizer 141 has been fully approved by the Bureau of Animal Industry as a nontoxic plasticizer for use in containers, wrapping films, packaging materials and other plastic products intended for contact with food items.

Because it does not irritate human tissues, Santicizer 141 has also been effective in a number of specialty items. These include hospital sheeting and tubing, plastic baby clothing, shoes, dentures and anatomical restorations.

Santicizer 141 improves the processing characteristics of most formulations because of excellent resin solvation. It also imparts several other important characteristics to the finished plastic: flame resistance, low-temperature flexibility, nonvolatility, and good resistance to abrasion, oil, grease, and weathering.

Find out more on how this versatile product can help solve your processing problems. The coupon brings you complete information and technical bulletin.

## New Coumarin Use

New application for coumarin is its use as a mask in animal glues for gummed tape. Processors like to use coumarin because of its high "staying power," even after heat has been applied during processing.

## Quick Facts

More than 35,000 different items are manufactured from rubber. Monsanto supplies accelerators, antioxidants and special materials to the rubber industry in large quantity.

## from the MONSANTO BOOKSHELF...



**Chloro-IPC** . . . this new bulletin completely describes Chloro-IPC and its use for weed control. Included are sections describing the herbicidal action, soil life and application of Chloro-IPC, and a list of weeds which it controls. Helpful information is also given on different types of Chloro-IPC formulations which are possible. Send the coupon today for your copy.

**Fumaric Acid** . . . A new bulletin is packed with helpful information concerning Fumaric Acid applications in coatings and polyester resins. Fumaric acid is a polyfunctional acid capable of a wide diversity of chemical reactions because of its two carboxyl groups and an active double bond. These are particularly suited for polymer formation. The bulletin, which is primarily for the synthetic resin trade, covers such subjects as chemical reactions, fumaric acid in drying oils, in tall oil varnishes, in steam-set inks, and in polyester resins. It also gives details on experimental research with fumaric acid in alkyd resins. The coupon will bring your copy by return mail.

**DOA** . . . a new technical bulletin on di(2-ethylhexyl) adipate is

yours upon request. This bulletin will bring you basic technical information on this widely used plasticizer which is used by the vinyl industry for imparting low-temperature flexibility. The bulletin covers physical properties and has several tables showing properties of polyvinyl chloride plasticized with DOA. Other tables show viscosity build-up in plastisols and typical hose formulations. Clip the coupon and mail for your copy.

**DNODP, DI (n-OCTYL, n-DECYL) PHTHALATE**, this plasticizer, which is a superior product for vinyl film, vinyl sheeting and garden hose, is covered in a new technical bulletin just published by Monsanto. The bulletin gives details on physical and chemical properties together with tables showing the effect of plasticizers on physical properties of polyvinyl chloride plastics. Other information includes sections on sheeting formulations, DNODP in vinyl dispersions, and material on electrical properties. Send coupon now for your copy.



\*Reg. U. S. Pat. Off.

.....

MONSANTO CHEMICAL COMPANY 5/54  
1702 South Second Street, St. Louis 4, Missouri

Please send information on: ☐ Santoquin

Please send: ☐ Methyl Toluene Sulfonate Data Sheet ☐ Chloro-IPC Bulletin O-114  
☐ Santicizer 141 Bulletin ☐ Fumaric Acid Bulletin O-115  
☐ Succinonitrile Data Sheet ☐ DOA Bulletin O-106  
☐ Succinonitrile Sample ☐ DNODP Bulletin O-109

Name .....

Company ..... Title .....

Street .....

City ..... Zone ..... State .....

.....

When inquiring check CP 8158 on handy form, pgs. 2-3

## MATERIALS

based compounds makes only slight difference in hiding power.

**Description:** Micro Velva L is a naturally occurring mineral, composed of magnesium and aluminum silicates and a small proportion of calcite. Pigment has not been chemically processed, but it has been dry ground and jet milled to an extremely fine particle size. Physical properties are given below:

Particle size (microns)	0.8
Color	white
Reflectance (MgO = 100)	88-92
Sp gr	2.60
Oil absorption (Gardner Coleman)	47 ± 5
Water soluble salts (%)	2
pH (0.25% aqueous extraction)	9.2

Pigment does not cause coagulation of latex paints.

(Pigment for latex paints is a product of Carbola Chemical Co., Inc., Dept. CP, Natural Bridge, N. Y. . . . check CP 8159, pages 2 and 3.)

## Hydrophilic starch series for calender-sizing boxboards . . .

gives smooth, well-bonded surface for improved appearance and printing properties

**Uses:** For calender sizing boxboard, wallboard, and other porous boards to give oil-resistant surfaces; in tub sizing to improve pick, fold, and mullen; and in formulations with other starches for improved grease-resistance.

**Features:** Excellent film-forming and hydrophilic properties of sizing material give smooth, well-bonded surfaces for improved appearance and printing properties. Coating also retards penetration of subsequent coatings of oily materials, such as ink, grease, and wax.

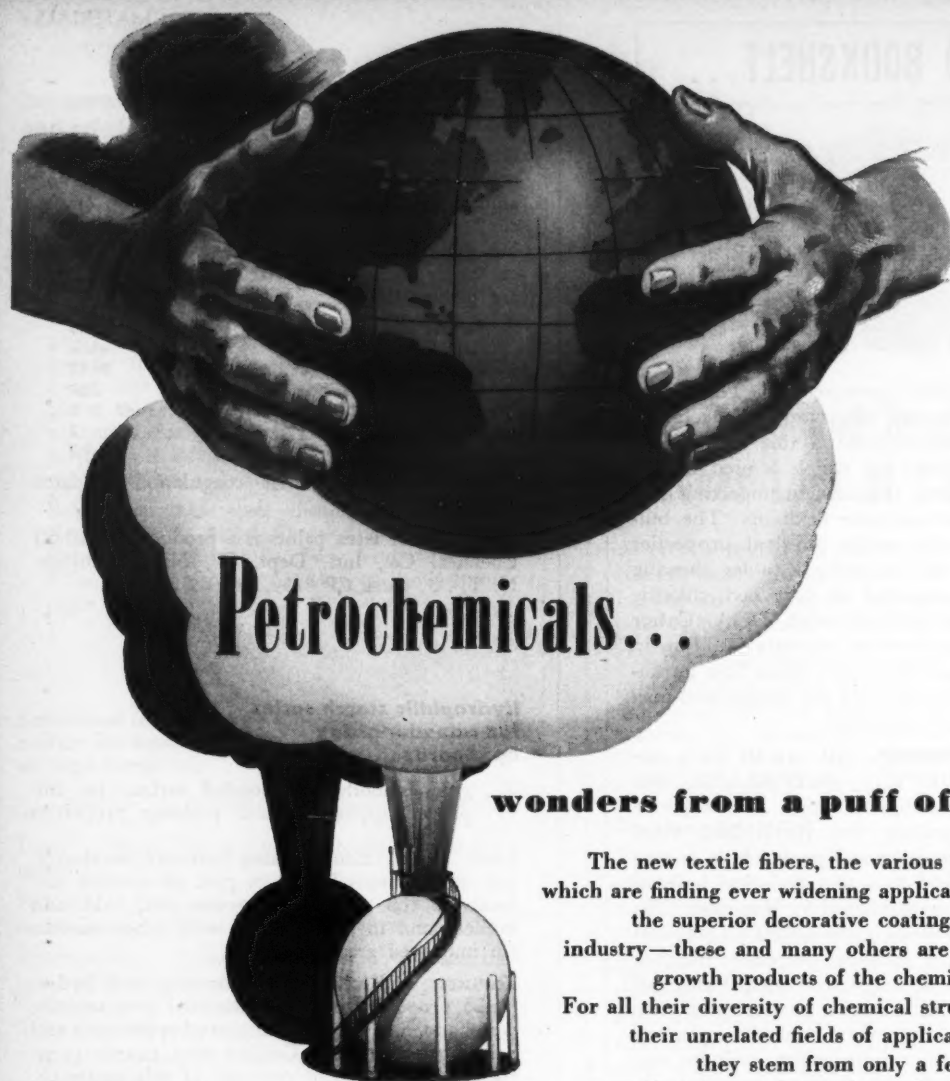
**Description:** CM Starches are sodium salts of carboxymethyl derivatives of starch. They are white to tan in color, and come in three viscosity grades: high, medium, and low.

(Starches for sizing are a product of National Starch Products, Dept. CP, 270 Madison Ave., New York 16, N. Y. . . . or for more information check CP 8160 on handy form, pages 2 and 3.)

## Looking for a chemical raw material or intermediate? . . .

The alphabetical Product Directory (pages 213 to 216) will help you find it in a hurry. This listing, started by CHEMICAL PROCESSING in 1930, "puts the finger" on all subjects, products, equipment in editorial columns and advertisements of each issue.





# Petrochemicals...

## wonders from a puff of gas

The new textile fibers, the various plastics which are finding ever widening applications, the superior decorative coatings of the paint industry—these and many others are the growth products of the chemical industry. For all their diversity of chemical structure and their unrelated fields of application, they stem from only a few simple but versatile primary chemicals produced from petroleum gases which we call petrochemicals. At Tuscola, Illinois, National Petro-Chemicals Corporation is now manufacturing such petrochemicals, in particular ethyl alcohol and ethyl chloride. A polyethylene plant will begin operations in 1955. If you need petrochemical building blocks in your production, why not consult with us regarding your raw material requirements.



# NATIONAL PETRO-CHEMICALS

C O R P O R A T I O N

A joint enterprise of National Distillers Products Corporation and Panhandle Eastern Pipeline Company

120 BROADWAY, NEW YORK 5, N. Y.

## MATERIALS

### Auxiliary plasticizer for PVC has good oxidation stability, reduces volatility losses . . .

used in combination with dioctyl phthalate in opaque formulations

**Uses:** As an auxiliary low-temp plasticizer for opaque polyvinyl chloride formulations, such as garden hose, sheeting, plastisol or organosol-coated fabrics.

**Features:** In combination with dioctyl phthalate, auxiliary plasticizer improves low temp characteristics. Formulation exhibits less volatile loss than many low temp primary plasticizers. Lower soap extraction losses and a lesser tendency to mar varnish and lacquer surfaces are also realized.

Internal lubricity of this material aids calendering and extrusion operations. Because of low solvency for PVC resin, initial viscosities are lower. Viscosity buildup in plastisols and organosols is less than with straight primary plasticizers.

**Description:** Pycal 170 has physical properties given in table below:

Form	Mobile liquid
Color (Gardner 1933, max)	7
Sp gr (25°/25°C)	0.943
Viscosity (cp, 25°C)	33
Refractive index (25°C)	1.484
Acidity (as acetic acid, %)	<0.3

Since material has limited compatibility with PVC resin, manufacturer recommends that formulations contain about two parts of primary plasticizer to each part of auxiliary plasticizer.

Material should not be used in clear formulations subject to prolonged exposure to sunlight. Best stabilizers are the various barium-cadmium-epoxy systems and the organo-tin systems. Neutral lead stabilizers are also satisfactory. Manganese pigments, however, should not be used with this material.

(Auxiliary plasticizer is a product of Industrial Chemicals Dept., Atlas Powder Co., Dept. CP, Wilmington 99, Del. . . or for more information check CP 8161 on handy form, pages 2 and 3.)

### Shorter cycle, lack of blush & webbing in forming with cellulose acetate

Field trials of a special formulation of cellulose acetate developed for vacuum forming are said to indicate a shorter cycle and lack of blushing and webbing. Small cavities as well as large forming pieces can be made successfully, according to manufacturer. Available in clear and colored stock, material, called S704, is expected to find broad use in packaging items, and similar applications.

(Cellulose acetate formulation is a product of Plastics Div., Celanese Corp. of America, Dept. CP, 180 Madison Ave., New York 16, N. Y. . . or for more information check CP 8162 which is located between pages 2 and 3.)

# U.S.I. CHEMICAL NEWS

★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★

## Chemical Progress Week

Sponsored by the Manufacturing Chemists' Association, May 17-22 is the first annual Chemical Progress Week. Its purpose is to bring home to the American public the significance of the chemical industry in terms of the individual. U.S.I. as a member of the MCA, is happy to participate in this industry-wide effort.



## Organosodium Compounds Are Opening New Frontiers

Organosodium compounds, made in a liter flask or a 1000-gallon reactor, are opening new, economical routes to the synthesis of phenylacetic acid, dimethyl phenylmalonate, benzophenone, and many others, including organotin, -phosphorus and -silicon compounds. The method uses sodium dispersions, which are prepared by suspending microscopic sodium particles (10-20 microns) in various hydrocarbons, such as toluene, xylene or kerosene. High speed agitation is used to disperse the molten sodium in the liquid hydrocarbon.

The organosodium compounds are prepared by reacting organic compounds with the dispersed sodium. Phenyl sodium, for instance, is made by metering chlorobenzene into the sodium dispersion. The minute particles permit the reaction to start immediately and give high yields. Aliphatic, aromatic and heterocyclic derivatives can be formed in this manner.

For more detailed information, write for U.S.I.'s new Sodium Dispersion Booklet.

## Germanium Is Refined To Almost 100% Purity

A new, simple process reportedly refines germanium to practically perfect purity. It is also being used to refine various metals, organic and inorganic substances.

Germanium from the process may well be the purest material in existence. It is said to have only one atom of impurity in ten billion atoms of the material—about the same as a pinch of salt in 35 freight cars of sugar.

## Plastic Coating Protects Big Chemical Equipment

A plastic protective coating can extend service life and cut maintenance costs of large chemical processing equipment. The baked-on coating is said to resist exhaust gases containing corrosive chemicals and inhibit rust and blistering of metal surfaces.

Highly adhesive to metal surfaces, the coating is uniformly applied and then fused by baking. The coatings vary in thickness from 1/32 to 3/16 of an inch and form a continuous protective sheath over crevices. According to the manufacturer, cast iron duplex strainer bodies weighing 1,200 pounds have been protected in this manner.

## Use of Methionine Saves Lives In Study of Newborn Disease Caused by Rh Incompatibility

Shows Promise in Other Obstetrical Complications

Methionine shows excellent promise in the treatment of hemolytic disease (erythroblastosis) of the newborn, an often fatal disease caused by Rh incompatibility. In a preliminary study, 66.6% of babies whose mothers had taken

## Five New Intermediates Available to Industry

Five new chemical intermediates are available from U.S.I.: Allyl Acetone; Ethyl Chrysanthemumate; 2,5-Dimethyl Hexadiene-2,4; Ethyl- $\alpha$ -Allylacetacetate; and Ethyl Diazoacetate. They are potential building blocks for such products as pharmaceuticals, perfumes, fungicides, insecticides and fine chemicals and themselves are intermediates in U.S.I.'s complicated 18-step industrial synthesis of allethrin.

Except for Ethyl Diazoacetate, commercial and experimental quantities are available to industry. Ethyl Diazoacetate will not be available as such unless current studies show that it can be shipped and stored safely. However, U.S.I. has extensive facilities which can handle large quantities of the versatile chemical safely and is prepared to make these facilities available to other manufacturers for the synthesis of various derivatives.

Technical data sheets describing the intermediates can be obtained by writing Department D, U. S. Industrial Chemicals Co.

## Invisible Markings Made By Fluorescent Pencils

Fluorescent pencils are recommended for any place where invisible instructions or identification treatment is wanted. According to the manufacturer, markings are invisible on white or light surfaces, but will fluoresce a brilliant green when activated by blacklight.

methionine were saved, as compared with 5.25% surviving for cases refusing the prenatal treatment. These percentages are based on cases classified as severe by the clinicians.

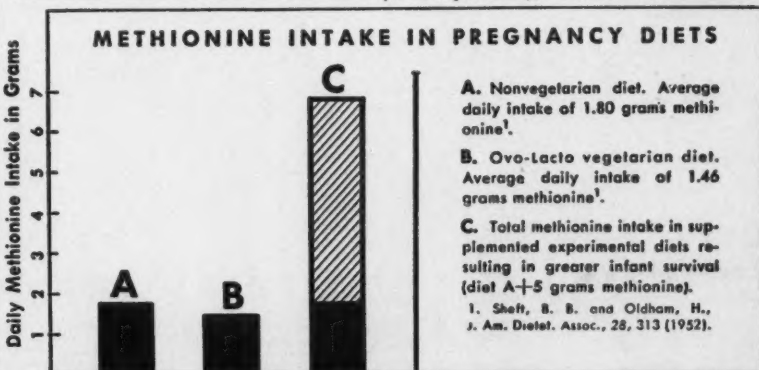
Hemolytic disease is accompanied by damage to the liver of the unborn child. Normal liver functions can be maintained only when the body obtains enough protein, and the amino acid methionine, a component of protein, is needed by the body to metabolize protein itself. Previous investigations have shown that methionine helps to protect the liver from damage, even when the protein intake is low. This led to the belief that methionine might be valuable in the treatment of hemolytic disease and other obstetrical complications associated with liver damage of the mother and newborn.

Cases involving many pregnant women suffering from Rh incompatibility were studied. Most of the women had lost children previously as a result of the disease. All were offered the chance to take methionine, but less than half decided to do so. Those not taking methionine were studied as a control group for purposes of comparison.

## Methionine Administered Orally

At the first signs of Rh-factor complications, the women who volunteered to take methionine were given 5 grams of the amino acid in capsule form each day (equivalent to that found in 5 quarts of milk). The researchers believed that the unborn offspring would use this extra methionine as a protection against liver damage. This treatment was continued until pregnancy was terminated. As mentioned previously, two out of

MORE





# U.S.I. CHEMICAL NEWS

CONTINUED

## Methionine Saves Lives

three newborn whose mothers took methionine survived, as compared with about one in twenty surviving when methionine was not taken by the mother.

### Other Complications Studied

The authors also studied the value of methionine in treating other types of obstetrical complications associated with liver and kidney damage. These were toxemia of pregnancy, postdelivery shock and inflammation of the liver. The results in these studies were also encouraging.

Toxemia implies the presence of toxic substances in the blood. The tendency towards insufficient protein intake during pregnancy becomes more pronounced during toxemia. This condition is reported to cause more deaths than any other complication in obstetrics. In the work reported, a beneficial diuresis to alleviate the toxemia followed the administering of methionine to patients. Kidney function seemed to be improved. In some cases, this happened after ordinary medication had failed. Edema associated with impaired kidney function also was relieved after methionine had been given.

Methionine assisted in the treatment of postdelivery shock and inflammation of the liver. Postdelivery shock can bring about impaired functions of the liver and kidney which sometimes lead to permanent damage.

Obstetrics is one of the many fields of medicine where methionine is being used in increased amounts.



## Adhesives Set Under Water

Adhesives which set under water were recently announced. Said to give good adhesion to metals, glass, paper, fabrics and plastics, the new products remain pliable, yet retain their adhesive strength at temperatures ranging from -55 to over 250° C.

## Ointments Protect Skin From Chemical Irritants

Two new types of ointments which protect the skin against various industrial irritants have been marketed.

The first resists organic solvents and solvent-borne irritants. It contains a modified carbohydrate gum base. When dry, the protective gel is said to form a continuous elastic film which adheres to the skin.

The other type is designed to protect the skin from water solutions and water-borne irritants. Two creams of this type are available. They are described as plasticized combinations of ethyl cellulose and castor oil in mixed propanols with a water-repellent vanishing cream base. The creams form invisible, water-insoluble coatings on the skin which withstand normal washing with soap and water.

## Safety Instrument Runs Quick SO<sub>2</sub> Determinations

A portable instrument for quickly determining sulphur dioxide concentrations is said to be exceptionally accurate and easy to use. The maximum allowable concentration of SO<sub>2</sub> in working atmospheres is 10 ppm for an 8-hour exposure. The new device determines concentrations of from 0 to 50 ppm.

The manufacturer of the safety apparatus expects it to be valuable in such process industries as petroleum refining, chemical processing, and paint and pigment.

## New Dust Collector Holds Fine Particles

A newly developed dust collector is designed for applications where extremely fine particles are involved or where the material must be collected in a dry state.

The cleaning cycle is described as continuous, with the cleaning media being automatically reconditioned by a jet of high pressure air forced through the cloth.

## TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

**Tweezers** which operate on a plunger principle and can pick-up oddly shaped objects have been marketed. They are said to be ideal for highly polished or sterile pieces. (No. 1030)

**A new drug for ulcer treatment** has been introduced. Clinical and animal tests are said to have shown that the compound has a powerful effect in reducing the secretion of acid in the stomach, instead of merely neutralizing the acid already secreted. (No. 1031)

**Radioactivity absorbers** are available which can be used to determine energies of photons and beta radiations, check isotope purity, identify radioactive species, and count a radioisotope in the presence of another. (No. 1032)

**A new moisture meter** is said to measure surface moisture in powdered, granulated or fibrous material in less than 2 minutes and to be accurate to 2% of surface moisture as compared to standard air-dried surface moisture results. (No. 1033)

**A quick-acting electronic cleaner** for contacts, controls and tuners in television sets, radios and record changers has been developed. According to the company, the product eliminates noise caused by dirt from volume controls. (No. 1034)

**A new caulking compound** comes in tape form. Supplied in a variety of widths and thicknesses, the tape is described as both a corrosion inhibitor and vibration cushioner. It can be painted over, or even baked, after application. (No. 1035)

**Liquid resins** for use in the production of reinforced plastics tooling are available. The manufacturer states they can be used in combination with fiberglass fabrics in making spotting racks, checking fixtures and assembly jigs. (No. 1036)

**Thiophenol** is being produced in semicommercial quantities. It is expected to find use in such products as pharmaceuticals, dyes, polymerization regulators and oil additives. (No. 1037)

**A liquid synthetic rubber** spreads easily like paint and rubberizes at normal temperature. Designed for home and industrial repairs, the product is reported to form a flexible film that adheres to plastic, metal, wood, fabric and glass. (No. 1038)

**A pocket-sized magnet** can be used as a recovery tool by anybody who works with metal. The self-contained instrument can be attached to a rope or wire and lowered in vertical pipes, water, barrels and other inaccessible areas. (No. 1039)

## PRODUCTS OF U.S.I.

### ALCOHOLS

Amyl Alcohol (Isoamyl Alcohol)  
Butanol (Normal-Butyl Alcohol)  
Fusel Oil — Refined  
Propanol (Normal-Propyl Alcohol)

### Ethanol (Ethyl Alcohol)

Specialty Denatured—all regular and anhydrous formulas  
Completely Denatured—all regular and anhydrous formulas  
Pure—190 proof U.S.P.,  
Absolute—200 Proof  
Solax®—proprietary solvent—regular and anhydrous

### ANTI-FREEZE

Super Pyro® Anti-Freeze  
U.S.I. Permanent Anti-Freeze

### ETHERS

Ethyl Ether, U.S.P.  
Ethyl Ether, Absolute—A.C.S.

### ACETONE—A.C.S.

### ANSOLS

Ansol® M  
Ansol® PR

### ACETIC ESTERS

Amyl Acetate—Commercial and High Test  
Butyl Acetate  
Ethyl Acetate—all grades  
Normal-Propyl Acetate

### OXALIC ESTERS

Dibutyl Oxalate  
Diethyl Oxalate

### PHTHALIC ESTERS

Diamyl Phthalate  
Dibutyl Phthalate  
Diethyl Phthalate

### OTHER ESTERS

Dialol®  
Diethyl Carbonate  
Ethyl Chloroformate

### RESINS (Synthetic and Natural)

Arochem®—modified types  
Arofen®—pure phenolics  
Aroflat®—for special flat finishes  
Aroflint®—room temperature curing phenolic  
Aroplaz®—alkyls and allied materials  
Aroplast®—copolymer modified alkyls  
Ester Gums—all types  
Natural Resins—all standard grades

### INSECTICIDE MATERIALS

Allethrin  
CPR Concentrates: Liquid & Dust  
Piperonyl Butoxide  
Piperonyl Cyclohexene  
Pyrethron® Concentrates: Liquid & Dust  
Pyrethrum Products: Liquid and Dust  
Rotenone Products: Liquid and Dust

### INFESTIGU MATERIALS

Indalone®  
Triple-Mix Repellents

### INTERMEDIATES

Acetoacetanilide  
Acetoacet-ortho-chloroanilide  
Acetoacet-ortho-toluidide  
Acetoacet-para-chloroanilide  
Ethyl Acetoacetate  
Ethyl Benzoylacetate  
Ethyl Sodium Oxalacetate

### FEED PRODUCTS

Calcium Pantothenate (Feed Grade)  
Choline Chloride  
Curbay 8-G\* 80  
dl-Methionine (Feed Grade)  
Nicotin, U.S.P.  
Riboflavin Concentrates  
Special Liquid Curbay®  
U.S.I. Vitamin B<sub>12</sub> and  
Antibiotic Feed Supplements  
Vacatone® 40

### OTHER PRODUCTS

Acetaldehyde  
Caustic Soda  
Ethylene  
IPC (Isopropyl-N-Phenyl Carbamate)  
CIPC  
Liquid Chlorine  
Metallic Sodium  
Methionine (Pharm.)  
N-Acetyl dl-Methionine  
Nitrocellulose Solns.  
Propionaldehyde  
Propionic Acid  
Sulfuric Acid  
Urethan, U.S.P.  
\*Reg. U.S. Pat. Off.

# U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation

120 BROADWAY, NEW YORK 5, N. Y.

BRANCHES IN ALL PRINCIPAL CITIES

**Fabrics don't yellow  
when washed . . .**

modified urea resin also helps  
crease resistance

Fabrics treated with Resloom E-50, a modified urea thermosetting resin, are reported to show no yellowing on laundering. Mill tests conducted recently on the product demonstrated its use for white and white-background applications. Soft hand, good shrinkage control, ironability, and crease resistance, are said to be provided as well.

Other reported advantages imparted by the product include: no build-up on texturizing equipment, excellent durability of finish to alkaline wash, compatibility with common hand modifiers, and excellent storage life and bath stability.

The chemical can also be used for Schreiner, deep embossed, glazed, or other texturized effects, either alone or in combinations with thermoplastic and thermosetting resins.

(Product of Merrimac Division, Monsanto Chemical Company, Dept. CP, Everett, Mass. . . or for more information check CP 8163, pages 2 and 3.)

**Method of studying  
fiber performance**

Techniques for studying fiber performance in many different types of fabric blends are described in illustrated 16-page booklet.

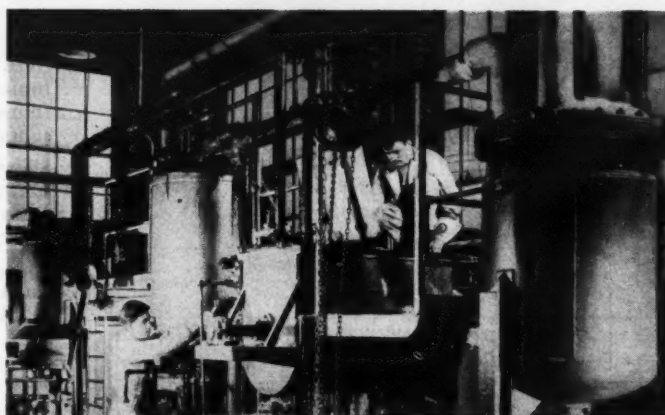
Booklet "Inner Structure" is issued by Textile Fibers Dept., Carbide and Carbon Chemicals Co., div. of Union Carbide and Carbon Corp., Dept. CP, 30 East 42nd St., New York 17, N. Y. When inquiring specify CP 8164 on handy form, pages 2 and 3.

For more information on product at left, specify CP 8165 . . . see information request blank between pages 2 - 3.

For more information on product at right, specify CP 8166 . . . see information request blank between pages 2 - 3.



# Modern Witco Laboratory



↑ A complete pilot plant permits study of chemical operations on a scale simulating actual plant processes, thus permitting evaluation of equipment as well as method.

Using the most modern equipment devised, experienced chemists develop new Witco products . . . provide complete technical service information. ↓



**for complete technical service  
more efficient chemical applications  
improved customer products**

Illustrated above is Witco's Technical Service Laboratory, staffed by skilled chemists and engineers who work with the most modern experimental and testing equipment. Linked with the activities conducted at Witco's other two research centers, these extensive technical service facilities are devoted to the improvement of existing products . . . the development of better new chemicals . . . more efficient and economical usages . . . the solution of customers' manufacturing problems.

In every field where Witco organic chemicals are used—rubber, plastics, paint, general chemical processing—our Technical Service Department will gladly lend expert assistance in surmounting your production difficulties.



**WITCO CHEMICAL COMPANY**

260 Madison Avenue, New York 16, N. Y.

Los Angeles • Boston • Chicago • Houston • Cleveland  
San Francisco • Akron • London and Manchester, England

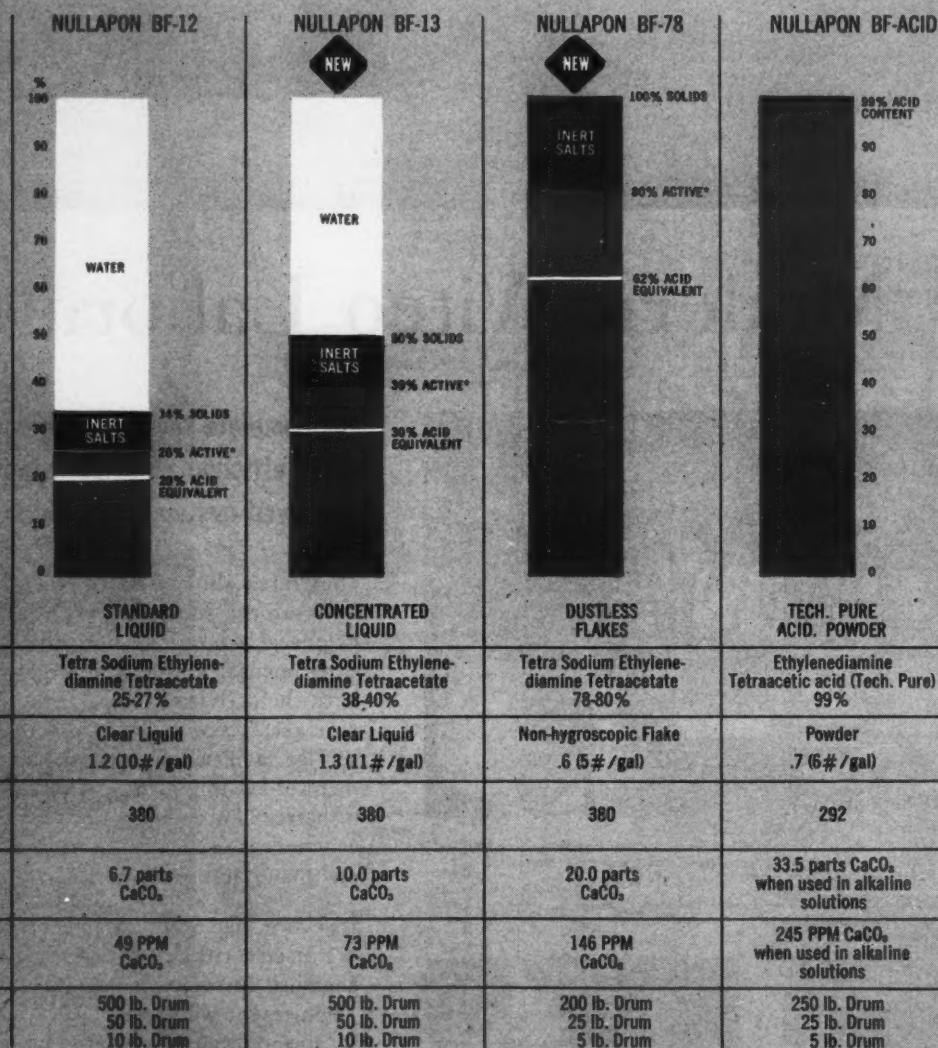
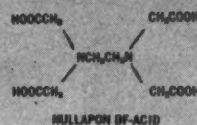


ANTARA



# NULLAPONS®

are outstanding sequestering or chelating agents capable of controlling, by deionization, undesirable di- or tri-valent metal ions in aqueous solution



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## ANTARA CHEMICALS

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and literature on Nullapons.

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CP

## MATERIALS

### Ability of detergent to protect metals demonstrated

Demonstration of detergent's ability to protect sensitive metals such as magnesium, copper, zinc, and brass when used alone or in conjunction with synthetics and polyphosphates is included in 12-page booklet. Detailed description is given of detergent, Metso 99, sodium sesquisulfate. Text deals with evaluations of sodium sesquisulfate with respect to basic detergent properties of wetting, emulsification, dirt suspension, and prevention of re-deposition. Popular detergent uses and general directions are tabulated.

Bulletin on Metso 99 is available upon letterhead request to Philadelphia Quartz Co., Dept. CP, Public Ledger Bldg., Philadelphia 6, Pa.

### Describes hydrated calcium silicate as reinforcing pigment in rubbers

Finely ground precipitated hydrated calcium silicate Silene EF, is described in 32-page bulletin. Thoroughly discussed are physical properties of cured natural, GR-S, nitrile, and Neoprene rubbers formulated with this material. Also treated are formulations of polyvinyl chloride, and Neoprene adhesives.

(Silene EF is a development of Columbia-Southern Chemical Corp., Subsidiary of Pittsburgh Plate Glass Co., Dept. CP, One Gateway Center, Pittsburgh 22, Pa.)

"Silene Bulletin No. 2" is available from Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio. When inquiring specify CP 8168 on handy form, pages 2 and 3.

### Plasticizer stabilizes PVC to heat and light . . .

epoxy polymer imparts oil and soap resistance to formulations

Uses: In polyvinyl chloride resin compounds that are calendered, extruded, or molded. Material can also be used in plastisol and organisol formulations.

Features: Plasticizer improves heat and light stability. Formulations exhibit low volatility and excellent resistance to extraction by oil, gasoline, and soap solutions. Use of the plasticizer overcomes heat stabilization problems that appear when phosphates, chlorinated paraffins, or ethers are used as auxiliary plasticizers.

Description: PX-800 Epoxy is a highly compatible epoxy polymer plasticizer. In addition to PVC and its copolymers, plasticizer is compatible with such resins as chlorinated and nitrile rubbers, nitrocellulose, and ethyl cellulose. It is incompatible with polyvinyl acetate, cellulose acetate,

and cell  
these typ

Sp gr  
Acidity  
Color  
Viscosity  
Freezing  
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CP 81

When inquiring check CP 8167 on handy form, pgs. 2-3

## MATERIALS

and cellulose acetate butyrate. PX-Epoxy has these typical physical properties:

Sp gr (25/25°C)	0.992
Acidity (% as acetic acid)	0.1
Color (APHA)	125
Viscosity (cps @ 25°C)	430
Freezing point (°C)	0.5
Flash point (°F)	450
Refractive index (25°C)	1.471
Odor	Mild

Plasticizer works regardless of metallic stabilizer used. Its use can reduce the amount of stabilizer that would ordinarily be required.

(Stabilizing plasticizer is a product of Pittsburgh Coke & Chemical Co., Dept. CP, Grant Building, Pittsburgh 19, Pa. . . . check CP 8169, pages 2 & 3.)

### Moisture-resistant epoxy resin has usable pot life of 3 to 5 days . . .

cure time is two to four hours at 250°F

**Uses:** For hermetically sealing electrical equipment such as resistors, electronic circuits, coils.

**Features:** Usable pot life of resin is three to five days. Cure time is from two to four hours at 250°F, with longer cure at lower temp.

Moisture-resistant resin also features excellent electrical and physical properties. Low viscosity and freedom from volatiles gives increased impregnation qualities.

**Description:** Scotchcast electrical insulation resin No. 3 is of the epoxy type, and comes in two-part liquid form. It is cold-pouring, and fillers can be used to achieve optimum physical, chemical, and electrical qualities. No chemical degradation takes place within an operating range from -65 to 250°F. Resin is resistant to acids, alkalis, solvents, and oils, has excellent adhesion to most metals and plastics.

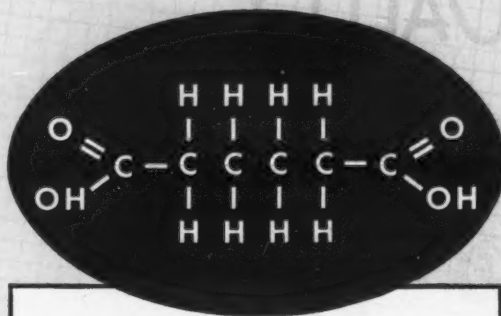


Resin hermetically seals electrical equipment

and dissipation factor low, over a frequency range of 60 c to 30 mc.

(Electrical insulating resin is a development of Minnesota Mining and Manufacturing Co., Dept. CP, 900 Fauquier St., St. Paul 6, Minn. . . . check CP 8170 on handy form, pages 2 and 3.)

## Investigate . . . DU PONT ADIPIC ACID



White crystalline solid . . . . . 99.60% min.

### PHYSICAL PROPERTIES

**Melting Point**—152 0.1°C. (305.6 0.2°F.)

**Solubility**—Soluble in Methanol, slightly soluble in water and cyclohexane at room temperature.

**pH of 3% solution**—2.7 @ 25°C.

### CHEMICAL PROPERTIES

**Relatively Stable**—can be held in molten state for long periods without decomposition . . . decomposes at temperatures approaching its boiling point. Is not oxidized by strong nitric acid at ordinary temperatures.

**Reacts with Alcohols** and basic materials in normal manner.

**Corrosion Characteristics**—Solid acid and aqueous solutions somewhat corrosive to mild steel. Can be handled by stainless steel under ordinary conditions.

**A versatile dibasic acid with many applications in plastics, petroleum, chemical and allied fields**

**IN PLASTICS**, Adipic Acid is used in the manufacture of monomeric and polymeric plasticizers for synthetic resins and as an intermediate for polyester laminating resins.

**IN THE PETROLEUM INDUSTRY**, Adipic Acid serves as an intermediate for esterlubes and lubricating oil additives.

**IN CHEMICAL MANUFACTURE**, Adipic Acid is used in the synthesis of salts, esters, amides, glycols and ketones. Other applications include the manufacture of adhesives and polyester rubber and cellulose stabilization.

Du Pont Adipic Acid is available in 50-lb. multi-ply paper bags. Prompt shipment can be made from strategically located stock points.

We'll be glad to send you more information on this versatile chemical. Just clip the coupon or write on your letterhead to: E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Dept., Wilmington, Delaware.



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DEPARTMENT  
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E. I. du Pont de Nemours & Co. (Inc.)

Polychemicals Department 585, Wilmington 98, Delaware

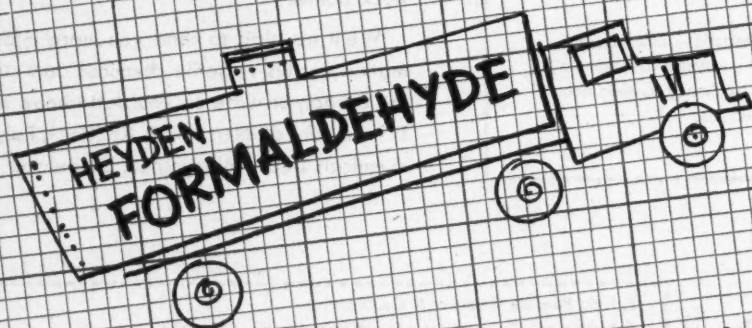
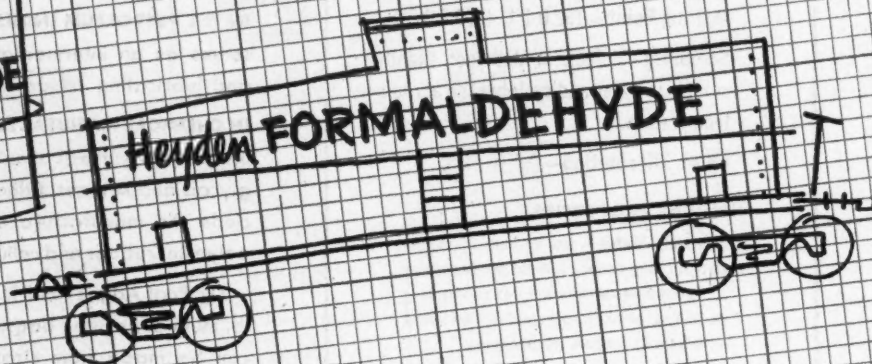
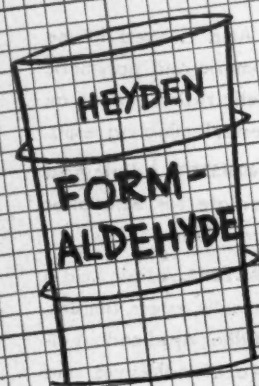
Please send me more information on Du Pont Adipic Acid—specifications, chemical and physical properties, suggested uses, bibliography, etc. I am interested in evaluating Adipic Acid for the following applications:

Name \_\_\_\_\_ Title \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 8171 on handy form, pgs. 2-3



# HIGHEST QUALITY IN EVERY DROP



## IN ANY QUANTITY

**HEYDEN CHEMICAL CORPORATION**  
342 Madison Avenue, New York 17, N.Y.  
Chicago • Cincinnati • Detroit • Philadelphia • Providence • San Francisco



### MATERIALS

#### Inorganic emulsifying and thickening agent for aqueous media . . .

colloidal suspensions made  
with 1% solution of agent

**Uses:** For thickening or gelling water dispersions, as a suspending agent, and for emulsifying oil in water systems.

**Features:** Good colloidal suspensions can be made with 1% solution of agent. At concentrations of 2 to 2.5%, a thixotropic gel is obtained. With 5% or more of agent, a firm gel is formed. Stable emulsions of oils in water can be made using 2% or less of agent.

**Description:** This is highly beneficiated hydrous magnesium silicate. It is a soft milky-white powder of fine particle size. Sp gr is 2.4; apparent density (lb/gal) is 5.25. Individual particles, which have been fully hydrated and separated in aqueous dispersion, attain an ultimate particle size of less than one micron.

(This is a product of National Lead Co., 111 Broadway, New York 6, N. Y. . . or for more information check CP 8172 on handy form, pages 2 and 3.)

#### Describes modified fatty acids

Typical characteristics, possible applications, and availability of manufacturer's modified fatty acids are discussed in six-page bulletin. Three graphs on work stability of aluminum-base greases are included. Some effects of product's unconventional behavior in finished materials are also discussed.

"Emery Modified Fatty Acids" is issued by Development & Service Dept., Emery Industries Inc., Dept. CP, 2504 Carew Tower, Cincinnati 2, Ohio. When inquiring specify CP 8173 on handy form, pages 2 and 3.

For more information on product at left, specify CP 8174 . . . see information request blank between pages 2 - 3.

#### Mixed isocyanates undergo condensation

two m  
isobut

**Uses:** for detergent intermediates.

**Features:** actions su  
When use  
and propy  
synthesize  
varying p  
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moderatin

**Description:** are water-v

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Physical p

Apparent  
Boiling  
Sp gr (4  
Flash po  
Color (4  
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butyric  
Chloro  
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Mixed isocyanates  
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N. Y.

**Mixed isomers of butylene oxide undergo polymerization and condensation reactions . . .**

two mixtures are available, one having 10% isobutylene for moderating effect

**Uses:** To extend use of epoxide compounds for detergents, emulsifiers, plasticizers, and intermediates.

**Features:** Products undergo ring-opening reactions such as polymerization and condensation. When used alone or in combination with ethylene and propylene oxides, they can be employed to synthesize polyglycol compounds having widely varying properties. One product contains relatively more isobutylene oxide isomer, which has moderating effect on reactivity.

**Description:** Mixed isomers of butylene oxide are water-white liquids, and contain four compounds:

- 1,2-butylene oxide
- cis-2,3-butylene oxide
- trans-2,3-butylene oxide
- isobutylene oxide

Butylene Oxides S (straight chain) contains only 1% isobutylene oxide. Butylene Oxide mixed isomers has approximately 10% isobutylene oxide. Physical properties of both mixtures are given below:

	Butylene Oxides	
	Straight Chain	Mixed Isomers
Apparent mw	72.1	72.1
Boiling range (5-95%, °C)	60-67	50-67
Sp gr (25/25°C)	0.826	0.822
Flash point (°F)	5	5
Color (APHA, max)	30	30
Water (%)	0.25	0.5
Aldehydes (as butyraldehyde, %)	0.5	1.0
Chlorides (as Cl, %)	0.2	1.0
Impurities (max)		

Mixed isomers are moderately irritating to eyes and skin. Vapors are quite toxic and should not be inhaled. Mixtures are extremely flammable.

(Butylene Oxide mixed isomers and Butylene Oxides S are products of Dow Chemical Company, Midland, Mich. . . . or for more information check 8175 on handy form, pages 2 and 3.)

**Uses, specifications of ethyl silicates**

Uses of ethyl silicates — as bonding agents for finely divided materials, as gelling agents for organic liquids, and as impregnants for porous substances — are covered in six-page data sheet. Information on properties, specifications, shipping, and methods of use for commercial grades of ethyl silicates are included.

Bul F-7250 is available from Carbide and Carbon Chemicals Co., Div. of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. . . . or check CP 8176, pages 2 and 3.

since 1933

# Glycerine

## is the Emollient



Daggett and Ramsdell, Inc. has used U.S.P. Glycerine as an ingredient in its "Perfect" Hand Cream since 1933. Glycerine is used in this famous beauty preparation for its emollient and hygroscopic properties. By retaining moisture, Glycerine prevents shrinkage of cream in the jar.

In the manufacture of oil-in-water emulsions — essential to the vanishing type of cream such as hand creams, face creams, and brushless shave creams — Glycerine is a favorite ingredient. It permits a smooth application of the cream and prevents "rolling" on the skin. It preserves the creams and lotions in good condition. Finally, Glycerine acts as a soothing agent to the skin.

Glycerine has many other properties which make it preferable for toilet preparations. It can act as a plasticizer, vehicle, penetrant, solvent, antifreeze and bodying agent. U.S.P. Chemically Pure Glycerine is fully accepted as safe for use in pharmaceuticals.

For the asking, we'll send you a 16-page booklet, "Why Glycerine for Drugs and Cosmetics?" detailing Glycerine's unique range of properties and applications. Write Glycerine Producers' Association, 295 Madison Avenue, New York 17, New York.

*Nothing takes the place of Glycerine*

When inquiring check CP 8177 on handy form, pgs. 2-3





# Available Again!

## PITTSBURGH

### Granular Carbons . . .



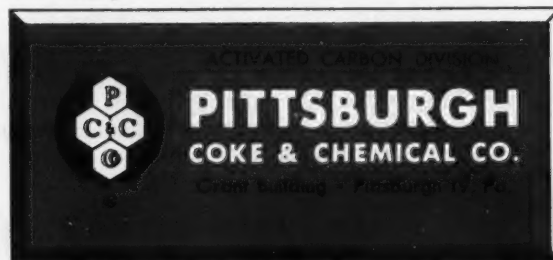
**. . . to help you cut your carbon costs  
up to 83%!**

Do YOU employ solvent recovery, catalyst support, gas purification or similar adsorption processes which utilize granular activated carbon? Then check with us today—for popular Pittsburgh Granular Carbons are available once again to help *cut* your carbon costs and actually *increase* the efficiency of your process.

Pittsburgh Granular Activated Carbons are coal-derived adsorbents with a unique selective ability to attract and retain certain gases, liquids and dissolved substances with which they come in contact. They are readily regenerated and are produced in sizes from 4 to 30 mesh to meet most adsorption requirements. The initial cost of these highly versatile Pittsburgh Carbons is considerably lower than similar materials.

Thanks to a recent expansion in our productive capacity, Pittsburgh Granular Carbons are now available to satisfy any commercial demand. So contact Pittsburgh *now* and begin cutting adsorption costs in your plant today. We'll welcome the opportunity to send you samples and literature, or to provide technical assistance. *Call or write today.*

WAD 8138



COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

When inquiring check CP 8178 on handy form, pgs. 2-3

## MATERIALS

### Indicator grade of diphenylamine for spectrophotometric analysis . . .

gives almost colorless solutions in concentrated sulfuric acid

**Uses:** For precision spectrophotometric analysis of nitrate and nitrite in many materials, including milk, blood, and tobacco. Can also be used for detection of Cr, Fe, Mn, U, and Zn; and for glycine titrations.

**Features:** Compound is extremely pure. It gives almost colorless solutions in concentrated  $H_2SO_4$ , hence it yields low blanks.

**Description:** Diphenylamine, Special Indicator Grade, is available as white solid in 100 gm and 500 gm lots.

(Indicator grade diphenylamine is a product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . or for more information check CP 8179 on handy form, pages 2 and 3.)

### Oleate soaps of organic intermediate have high emulsifying power at low concentrations

**Uses:** As an emulsifier intermediate in formulating water emulsion polishes and cleaners, cosmetic and pharmaceutical emulsions, leather dressings, emulsion paints, lithographic inks, household detergents, and textile chemicals.

**Features:** Oleate soaps have high emulsifying and dispersing power at low concentrations. Material is convenient to use because of its mild odor, high flash point, and low toxicity.

**Description:** Isopropylaminoethanols (IPIE) is a balanced blend of isopropylmonoethanolamine and isopropyldiethanolamine, and has the following physical properties:

Apparent molecular weight	116
Boiling range (°C)	110-265
Color	straw
Odor	mild
Freezing point (°C)	-50
Flash point (open cup, °F)	155
Pounds per gallon	7.5

Blend is effective at an IPAE: oleic acid mole ratio as low as 1:1.

(Isopropylaminoethanols (IPAE) is a product of Sharples Chemicals Inc., Dept. CP, 1100 Widener Bldg., Philadelphia 7, Pa. . . or for more information check CP 8180, pages 2 and 3.)

### PROCESSING & ENGINEERING DATA

Starts on page 190 of this issue

### Sulfonate resists hy

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**Uses:** A  
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such as w  
dispersing

**Features:**  
sisting hy  
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ranges is  
low foam

**Description:**  
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It is very  
Clear 19  
obtained  
8% HN

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### Fatty a data sh

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**Sulfonated oleic acid  
resists hydrolysis . . .**

finds use in acid wet processing operations

**Uses:** As a surface active agent in acid wet processing operations, such as wetting, penetrating, and dispersing.

**Features:** Product is stable, resisting hydrolysis under rigorous conditions of use and storage, even in acid solutions. High solubility and activity in low pH ranges is reported. Product has low foaming characteristics.

**Description:** Sul-Fon-Ate OA-5 is a true sulfonate of oleic acid. It is very soluble in acid media. Clear 1% solutions have been obtained in 9%  $H_2SO_4$ , 4%  $HCl$ , 8%  $HNO_3$ , and 45%  $H_3PO_4$ .

Surface tensions in distilled water are as follows:

Concentration (%)	Surface Tension (dynes/cm)	
	@ 77°F	@ 120°F
0.05	32.7	30.7
0.20	32.1	29.4
0.50	32.6	29.4

Standard Clarkson-Draves test for wetting properties shows that wetting speed, in general, increases as pH is reduced.

(Sulfonated oleic acid is a product of Organic Chemicals Div. of Tennessee Corporation, Dept. CP, 617-29 Grant Building, Atlanta 3, Ga. . . . check CP 8181 which is located between pages 2 and 3.)

**Fatty alcohol  
data sheet**

Typical analyses for 15 Cachalot-brand fatty alcohols are presented on notebook-size data sheet. Listed are the oleyl, cetyl-oleyl blends, cetyl, and stearyl alcohols.

Fatty alcohol data sheet is issued by M. Michel and Co., Inc., Dept. CP, 90 Broad St., New York 4, N. Y. When inquiring specify CP 8182 on handy form, pages 2 and 3.

For more information on product at right, specify CP 8183 . . . see information request blank between pages 2 - 3.

*Cyanamid's*

No. 3 of a series of advertisements

**ACRYLO-NEWS**

**AERO\*** Acrylonitrile, though a highly stable chemical, is the most reactive of the vinyl monomers. It is so versatile that it can be used either as an intermediate in the preparation of dyes, pharmaceuticals, insecticides and other useful products, or by direct application in the broad fields of rubber,

plastics and textiles. Its polymers and copolymers can be formulated to add many desirable properties to today's products and to create interesting new products. The following items and abstracts, gathered from many sources, indicate a few facets of current research with this versatile monomer.

★ ★ ★ ★ ★ ★

**A FLEXIBLE RESILIENT ADHESIVE** with excellent bonding properties has been used with laminations of vinyl chloride-vinylidene chloride copolymers. Composed of a rubbery acrylonitrile-butadiene copolymer, it has good color stability and is non-tacky when dry.

**IMPROVED BONDING OF POLYACRYLONITRILE FIBERS TO RUBBER** is the result of a process for the treatment of the fibers with an alcohol-soluble synthetic resin. The fibers find application in tire casings, belting, printing blankets and similar items.

**DRYING OILS FOR PAINTS, VARNISHES, COATING COMPOUNDS AND FLOOR COVERINGS** show improved properties when formulated with a copolymer of acrylonitrile and a diolefin such as butadiene. They are used as activating agents in compositions of soybean, fish, linseed and other oils.

**PLASTICS AND SYNTHETIC RESINS** displaying interesting properties have been made by copolymerizing acrylonitrile with ethylene sulfonyl fluoride. The process imparts both heat stability and plasticity to the final products.

**WORKABILITY OF HIGH ACRYLONITRILE POLYMERS** has been greatly increased by the plasticizing action of a water-soluble compound, such as N-substituted ethylene carbamate. This makes it possible to exploit the inherent solvent resistance and other advantages of polymerized acrylonitrile in the development of filaments, fibers and many plastics.

**PAPERS WITH IMPROVED WET AND DRY STRENGTH** have been prepared by using a copolymer of acrylonitrile and vinyl pyridine in a bleached sulfite pulp slurry.

(Some or all of the above items are covered by U.S. or foreign patents)

★ ★ ★ ★ ★ ★

Should you wish a more complete bibliography of current literature and new developments concerning acrylonitrile, we shall be glad to place your name on our mailing list.

As the pioneer producer of this exciting vinyl monomer, American Cyanamid has expanded its production facilities to assure users adequate supplies at low price. Write for technical assistance in your acrylonitrile research.

\*Trade-mark

**AMERICAN Cyanamid COMPANY**  
PETROCHEMICALS DEPARTMENT  
30 Rockefeller Plaza, New York 20, N. Y.



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Fatty Acids  
and Methyl Esters

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**EL DORADO**

for **PURITY  
SERVICE  
UNIFORMITY**

El Dorado has specialized in coconut oil products for more than half a century. That's one big reason you can depend on the performance of El Dorado products in your formulations. You'll find that El Dorado's standards are the highest in the industry.

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CAPRYLIC	ELDHYCO	CAPRIC
LAURIC	COCONUT	MYRISTIC
	PALMITIC	

METHYL ESTERS		
CAPROATE	ELDO 18	CAPRYLATE
CAPRATE	COCONATE	LAURATE
MYRISTATE		PALMITATE

For samples and specifications, write  
Dept. P

Rely on



Main office:  
311 California St., San Francisco, Calif.  
Plants:  
Bayonne, N. J., Oakland, Calif.

When inquiring check CP 8184  
on handy form, pgs. 2-3

## MATERIALS

### Refers to important uses of xanthine compounds

Description of physical and chemical properties of xanthine, hypoxanthine, and sodium xanthine is included in bulletin. Important applications of products in the fields of biochemistry and medicine are referred to.

Bul 114a is available from Schwarz Laboratories, Inc., Dept. CP, 230 Washington St., Mount Vernon, N. Y. When inquiring specify CP 8185 on handy form, pages 2 and 3.

### Use of surface-active agent improves uniformity of chemical fertilizers

Uses: To increase uniformity of superphosphate, ammonium sulfate, potash and nitrate fertilizers.

Features: When used in acidulation, ammoniation, and granulation, material works to offset variations in raw materials and manufacturing conditions. Material is stable in presence of calcium ions and most acids and alkalis.

Description: Udet F is an anionic surface-active agent of the alkyl aryl sodium sulfonate family. Available both as a free-flowing liquid and in powder form, it has the following characteristics:

	Liquid	Powder
Active (% min)	50	95
Sp gr	1.19	0.48
pH	8-9	8-9
Sodium sulfate (%)	2-3	2-3

(Surface-active agent is a product of Universal Detergents, Inc., Dept. CP, 1825 E. Spring St., Long Beach 6, Calif. . . . or for more information check CP 8186 on handy form, pages 2 and 3.)

### Hafnium carbide synthesized from carbon and HfO<sub>2</sub> . . .

data on properties provided by recent work  
at Oak Ridge National Laboratory

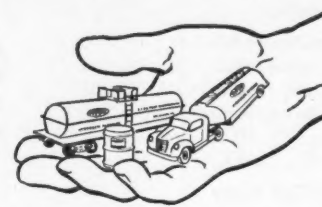
Recent work conducted by Ceramics Department of Oak Ridge National Laboratory, operated for AEC by Union Carbide and Carbon Corporation, has provided data on properties of hafnium carbide. The blue-black crystalline compound was synthesized by heating pellets of dry-pressed carbon and HfO<sub>2</sub> in a graphite crucible for two hours at 2000 to 2400°C. This was followed by five minutes at over 3000°C, which volatilized impurities and increased crystal size.

X-ray diffraction study of HfC cell structure showed it to be cubic, similar to NaCl. Cube edge was 4.635 Å, and sp gr was 12.52. Microhardness, measured with a Vickers indenter under a 50 gm load, gave an average V 50 value of 2913 (range was 2533 to 3202). As a reference, hardness of diamond is 8400 and boron carbide, 2400.

# Xtracts

## Hydrogen Peroxide Widely Used in Industry and Chemistry

"Albone," an aqueous hydrogen peroxide solution, is available in grades containing 35% and 50% by weight H<sub>2</sub>O<sub>2</sub>. It is water-white, extremely stable, and contains no organic stabilizers.



The most outstanding property of hydrogen peroxide is its oxidizing action on both organic and inorganic materials. A particular advantage of this oxidizing action is that no undesirable by-products are formed, since water is the only residue.

Widely used in bleaching textile fibers, wood pulp, fats and oils, wood, etc., it is also a versatile reagent in a large number of chemical reactions.

Under proper conditions, "Albone" oxidizes ferrous iron to ferric iron, nitrites to nitrates, sulfides and sulfitates to sulfates, halogen acids to the corresponding halogens (except fluorine), and alcohols and aldehydes to the organic acids or even to carbon dioxide in the presence of certain catalysts. Organic peracids result from the reaction of peroxide with the corresponding acid anhydride.

In contrast to its oxidizing properties, "Albone" has a strong reducing action under some conditions. It reduces cupric salts, silver and gold oxides, vanadic acid, periodates, bromates, and permanganates, generally with a liberation of oxygen.

"Albone," under certain conditions, adds on to ethylenic hydrocarbons to form glycols. With many inorganic oxides and hydroxides, it forms the corresponding peroxides. Most hydrate-forming salts produce perhydrates with hydrogen peroxide. Organic chlorides form organic peroxides, i.e., benzoyl peroxide from benzoyl chloride in an alkaline peroxide medium.

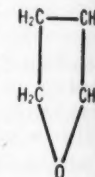
Hydrogen peroxide can be used in acid, neutral, or alkaline solutions. The rate of reaction can be controlled and directed

by proper selection of pH, total alkalinity, catalyst, temperature, and concentration.

For more information about properties and applications, send the coupon at right.

### Try Tetrahydrofuran (THF) for Those Hard-to-Dissolve Vinyl Polymers

Here's a powerful solvent for difficultly soluble organic materials and resins. It is one of the few solvents which will dissolve polyvinyl chloride at room temperature. High solids solutions (15-20%) can be prepared which do not gel on storage at room temperature.



With Tetrahydrofuran, you can get solutions of comparatively high solids content at practical working viscosities. This property, together with the lack of color and low boiling point of Tetrahydrofuran, makes it a most useful solvent for many resins and for production of clear, light-colored lacquers, adhesives and printing-ink compositions.

Many solvents, such as dimethyl formamide, carbon disulfide, ketones, etc., become much better solvents when mixed with THF. Often the mixtures are far more effective than either solvent by itself. A THF-water mixture becomes a most excellent solvent for cellulose acetate and alkaloids such as caffeine.

Its ether structure and ability to dissolve many organics make THF an excellent solvent medium for the Grignard, lithium aluminum hydride and sodium acetylide and many other reactions.

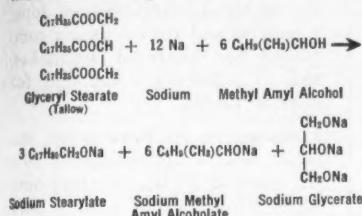
As a chemical intermediate, Tetrahydrofuran reacts by substitution and fission of the ring.

For more information about THF and other useful furan compounds, just check and send coupon at right.

## Sodium Reduction Leads to Fatty Alcohols



From the old springs the new. Thus tallow, for many years a stock base for soap, yields a fatty alcohol for synthetic detergents when treated with sodium. Typical reaction—



The reaction mixture is treated with water, and the fatty alcohol such as stearyl alcohol, to be used for manufacture of synthetic detergents, is recovered, as well as glycerine.

Today, sodium is an important reagent for reduction, polymerization, condensation, hydrogenation and dehydrogenation reactions. Highly reactive, it is still easily handled safely, and its reactions readily controlled. It's ready for the chemist in convenient-sized bricks or in tank cars. For more information about its properties and uses, how it can be converted to concentrated dispersions in inert media—a new form for speedy reaction—just check the coupon below.

### "Elvanol" Helps Make Stable Emulsions

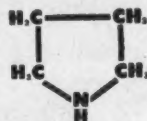
Just a small amount of "Elvanol" polyvinyl alcohol is all that's needed to make highly stable dispersions or emulsions of mineral and vegetable oils, many resins, waxes, organic solvents, etc. It functions as a protective colloid and surface agent which lowers interfacial tension—thus making emulsions which are resistant to creaming and phase separation. Because it is non-ionic "Elvanol" can be used in acid or alkaline media. In some applications, "Elvanol" serves as a binder and thickener as well as an emulsifying agent. High-quality dispersions can be easily prepared in simple equipment. To meet specific requirements several grades of "Elvanol" are available.

Check coupon for more information.

## New Products

### Pyrrolidine

This cyclic secondary amine functions as both a catalyst and reaction intermediate. Unusual compounds can be made by reactions involving addition, condensation, acylation, and alkylation. Highly reactive, this intermediate provides practical routes to useful industrial products, i.e.:



With carbon disulfide, to make rubber accelerators similar to those obtained from piperidine.

With alkyl halides, it gives N-alkyl pyrrolidines which can be converted to quaternary bases useful as sterilizers and surfactants.

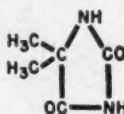
Introduction of the pyrrolidyl ring, a physiologically active nucleus found in many natural products such as alkaloids. With ethylene oxide, N-hydroxyethyl pyrrolidine is formed.

For more information, ask for Bulletin No. 23.

### Dimethyl Hydantoin (DMH)

With certain cyclic compounds—benzene, thiophene, furan, etc.—this reactive product forms addition complexes, and substitutions can be made at either the imino or carbonyl groups. Fission of the ring is possible with mineral acids and dilute alkali solutions. Reactions with formaldehyde yield a variety of compounds, including methylol derivatives and a series of resins varying from viscous, oily liquids to hard, brittle transparent solids. These resins are soluble in water, yielding low viscosity solutions which dry to hard, glossy films.

Check the coupon below for more detailed information about DMH and its derivatives.



E. I. du Pont de Nemours & Co. (Inc.)  
11507 Nemours Bldg., Wilmington,  
Delaware.

Please send me literature and information on:

- |   |                        |
|---|------------------------|
| <input type="checkbox"/> "Albone" Hydrogen Peroxide   | Name _____             |
| <input type="checkbox"/> Tetrahydrofuran (THF)        | Title _____            |
| <input type="checkbox"/> Sodium                       | Firm _____             |
| <input type="checkbox"/> "Elvanol" Polyvinyl Alcohol. | Address _____          |
| <input type="checkbox"/> Pyrrolidine                  | City _____ State _____ |
| <input type="checkbox"/> Dimethyl Hydantoin           |                        |

3

When inquiring check CP 8187 on handy form, pgs. 2-3

## MATERIALS

Although still in laboratory stage, HfC holds interest for possible application in high-temp equipment, cutting tools, and grinding media. Present indications are that compound does not have high impact resistance.

(Information supplied through courtesy of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y.)

### Offer three additional sizes of anhydrous caustic soda for specialized uses

Three additional particle sizes of anhydrous caustic soda for specialized uses are being offered by manufacturer. These sizes, fine flake, crystal flake, and powdered, supplement the regular flake, solid, and liquid forms of caustic now available.

Materials are available in open-head drums as well as regular drums with 14" off-center caps. Screen sizes are as follows: fine flake (dustless), through 4 mesh caught on 20 mesh; crystal flake (dustless), through 8 mesh caught on 20 mesh; and powdered, through 20 mesh.

(Caustic soda is a product of Hooker Electrochemical Co., Dept. CP, 10-15 47th St., Niagara Falls, N. Y. . . . or for more information check CP 8188 on handy form, pages 2 and 3.)

### Announces maleic anhydride in briquette form

Maleic anhydride is being produced in briquette form. The chemical is a highly active intermediate used in producing synthetic resins, pharmaceuticals, rubber chemicals, surface active agents, plasticizers, and stabilizers for vinyl plastics.

(Aero maleic anhydride is product of American Cyanamid Company, Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. . . . or for more information check CP 8189 on handy form which is located between pages 2 and 3.)

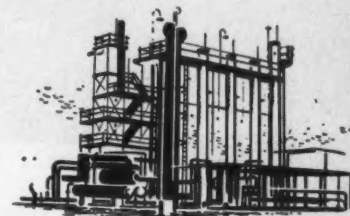
### Discusses epoxy fatty acid esters used as vinyl plasticizers

Bulletin describes series of monohydric and polyhydric alcohol esters of oleic, soybean, and cottonseed fatty acids, epoxidized with peracetic acid. These show good general plasticizer performance and stabilizing action for chlorinated polymers, such as vinyl. Research results and applications are included.

Bul 56 is issued by Buffalo Electro-Chemical Co., Inc., division of Food Machinery & Chemical Corp., Dept. CP, 34 Sawyer Ave., Buffalo 7, N. Y. When inquiring specify CP 8190 on handy form, pages 2 and 3.

## PROBLEM

To produce hydrogen essentially free of carbon monoxide which has a deleterious effect on product quality and plant capacity for edible oil producers.



## SOLUTION

GIRDLER developed a highly active durable catalyst, G-12, for removal of carbon monoxide from the hydrogen. Cost of hydrogen production was reduced and carbon monoxide content was cut 95% resulting in:

**Hydrogen with less than 5ppm of carbon monoxide**



Take advantage of the experience of Girdler in solving your catalyst problems!

FOR

**Catalysts**



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A DIVISION OF  
NATIONAL CYLINDER GAS COMPANY  
Gas Processes Division  
LOUISVILLE 1, KENTUCKY  
NEW YORK • TULSA • SAN FRANCISCO

When inquiring check CP 8191 on handy form, pgs. 2-3



## For value in full measure

Value is measured not only in quality and uniformity but in service as

well. You get full value in all three when you use Nialk chemicals.

*for instance...*

**NIALK CARBONATE OF POTASH:** Superior solubility and lubricating properties, plus highest uniformity, make NIALK Carbonate of Potash ideal as a dye extender in printing pastes for the finest of printed fabrics.

The value to industry of this and other NIALK products is created not only through constant research and strict quality control but also through fast, safe delivery and close attention to industry's needs.

### NIAGARA ALKALI COMPANY

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LIQUID CHLORINE  
CAUSTIC POTASH  
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TRICHLOROethylene

NIAGATHAL TETRACHLORO PHTHALIC ANHYDRIDE



### MATERIALS

**Room temperature curing is feature of two-part silicone rubber . . .**

material sets in 4 hr after mixing, cures in 24

**Uses:** As a caulking and glazing material, cloth-coating dope, a potting and encapsulating compound for electrical assemblies, and as a casting compound for flexible molds.

**Features:** At room temp, material sets in approximately four hr, cures in 24 hr, develops optimum properties in 4 to 7 days.



No gas has evolved in sample of Silastic cured 48 hr at room temp

Neither heat, pressure, nor full exposure to air is required to cure sections up to  $\frac{1}{8}$ " thick. Up to 50 psi is necessary for sections up to 1".

**Description:** RTV (Room Temperature Vulcanizing) Silastic is supplied as two separate components. When mixed, these react to form a non-heat vulcanizing system. No gas is evolved during cure. Typical physical properties for a  $\frac{1}{8}$ " cured section are given in the table:

Hardness (Duro, Shore A)	15-30
Tensile (psi)	130-500
Elongation (%)	300-600
Water absorption (7 days @ 70°F, %)	1-2
Dielectric constant (@ 10° c)	3.0-3.2
Power factor (@ 10° c)	0.005-.01

(Room temp vulcanizing silicone rubber is a development of Dow Corning Corp., Dept. CP, Midland, Michigan . . . check CP 8193, pages 2 and 3.)

For more information on product at left, specify CP 8192 . . . see information request blank between pages 2 - 3.

### Stability of hydrogen peroxide in high concentration covered

Stability of hydrogen peroxide in concentrations above 90% by weight, and factors which influence its rate of decomposition are discussed in bulletin. Method for determining hydrogen peroxide stability is described in detail.

In this technique the Warburg manometer has been adapted to measuring decomposition rate. Method is useful for all peroxide concentrations and is sensitive enough to give results in a brief length of time at ordinary storage temperatures.

Data are given on effects on stability of purity, stabilizers, acid concentration, temperature, and surface-to-volume ratio.

Bul 55 is available from Buffalo Electro-Chemical Co., Inc., a Div. of Food Machinery & Chemical Corp., Dept. CP, 34 Sawyer Ave., Buffalo 7, N. Y. When inquiring specify CP 8194 on handy form, pages 2 and 3.

### Titanium powder available in 99% grades for research

Some titanium powder has been produced for many years, but this has been chiefly a low purity grade (94% min) used for pyrotechnic purposes by the Armed Forces. Manufacturer has recently announced small quantities of purer (99%) titanium powder available for research projects. Material is made from duPont sponge of 99.5+ purity. The three grades offered are:

MD 101	99%	100 mesh	65%	325 mesh
MD 201	99%	200 mesh	90%	325 mesh
MD 301	95%	325 mesh		

(Titanium powder is a product of Metals Disintegrating Co., Inc., Dept. CP, 1170 Arthur Blvd., Elizabeth B, N. J. . . . or for more information check CP 8195 on handy form, pages 2 and 3.)

### Thermoplastic oil-resistant resin properties given in data sheet

A thermoplastic, oil-resistant resin which is polymerized to a relatively high molecular weight, for optimum physical properties in elastomeric and plastic compositions, is described in series of data sheets making up bulletin. Typical specifications on the material are given. Compound recipes for the material in GR-S, neoprene, and nitrile rubbers are included.

Bul on Polyrez B is issued by Harwick Standard Chemical Co., Dept. CP, 60 South Seiberling St., Akron 5, Ohio. When inquiring specify CP 8196 on handy form, which is located between pages 2 and 3.

## IN INDUSTRIAL OILS AND FATTY ACIDS . . .



- Oleic Acid (Red Oil)
- Animal Fatty Acids
- Vegetable Fatty Acids
- Stearic Acids
- Hydrogenated Fatty Acids & Glycerides
- Larex (Swift's Lard Oils)
- Neatex (Swift's Neat's-foot Oils)
- Spermex (Swift's Sperm Oils)
- Spermaceti U. S. P.
- Monoglycerides
- Sulfonated Oils
- Wool Oils
- Anti-Foam Agents
- Glycerine
- Tallow
- Palmex (for Steel Mills)

● In producing industrial oils and chemicals, Swift does nature *one* better. In producing them with modern equipment under the strictest and most professional laboratory and production control, Swift does nature *two* better.

Through extensive plant facilities in Hammond, Indiana, Harrison, New Jersey, and Chicago, Illinois, Swift oils and fatty acids are manufactured from animal, vegetable and marine sources. Because of these facilities and experienced personnel, Swift engineers are able to derive the *most* from the raw materials with which they work. The result? . . . a variety of versatile, quality products and product combinations to meet a wide variety of specialized needs.

Yes, in manufacturing industrial oils and chemicals, Swift does nature *one* better—but it is because Swift *makes* Swift products that you can depend upon their quality . . . and can *rely* on Swift for your industrial oil and fatty acid needs.

Why not check your requirements from the list at the left? Use the coupon below to obtain further information.

### ONE TRIAL IS BETTER THAN A THOUSAND CLAIMS

#### USE THIS COUPON FOR FURTHER INFORMATION

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Another of Swift's  
Products for Industry

When inquiring check CP 8197 on handy form, pgs. 2-3



# EDTA and ITS SODIUM SALTS

proved **BEST** among  
organic

## SEQUESTERING AGENTS

Comparisons have been made by a qualified laboratory, comparing: . . . "Tetrine"™ versus a similar chemical claimed more effective for sequestering trace metal ions in aqueous solution. Extensive tests were conducted using Glyco's Sodium Tetrine Liquid Conc. and the latter material.

Tests were made under practical commercial use conditions of pH, concentration, and time of contact . . . on iron, calcium and magnesium ions. Effectiveness in acid, alkaline and neutral solutions was determined. These agents were evaluated on equal cost basis.

### these were the results for iron:

- 1.—Under acid and neutral conditions, "Tetrine" showed a slight to 40% superiority, depending on the application.
- 2.—Under alkaline conditions, the products were about equally effective.

### these were the results for calcium:

- 1.—Under all pH conditions up to 8.7, "Tetrine" was considerably better.
- 2.—In tests using soap solutions and standard hard water, "Tetrine" was markedly superior in preventing hard water precipitation, and permitting the formation of foam where the other product did not.

These and other test results indicate that pure ethylenediamine tetraacetic acid and its sodium salts are definitely superior to all other commercial organic sequestering agents, for the elimination of the undesirable effects of trace metal ions in aqueous solutions.

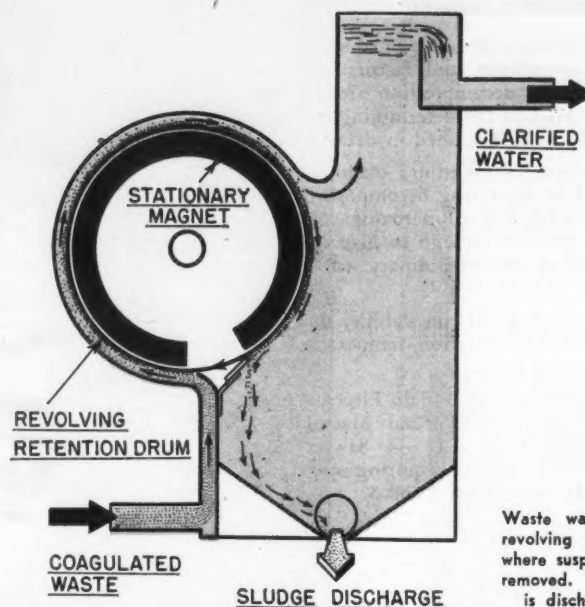
Remember that "Tetrine" is the purest EDTA available commercially. For samples and further information, please address your request to Dept. CP Glyco Products Co., Inc., 26 Court St., Brooklyn 1, New York.



**GLYCO PRODUCTS CO., INC.**

When inquiring check CP 8198 on handy form, pgs. 2-3

**ideas**



## *paper mill waste water clarified 1000 times faster*

**Suspended matter clings to iron oxide particles and is attracted to revolving magnetic drum**

Recently developed system utilizes magnetic clarifiers for continuous removal of suspended matter and colloidal dirt from paper and board mill waste. Tests show it will clarify water 1000 times faster than conventional methods.

Following a five minute detention period, waste water can be processed in three to ten seconds, at rates up to 720,000 gal per day. Installation is only about 1/6th the size of present system.

Operation is as follows: contaminated water is pumped to small mixing tank, where specified amounts of iron oxide, ferrous sulfate, and lime slurry are added. After mixing, water flows to the five minute detention tank, where slow agitation aids formation of tough flocs. Due to presence of iron oxide in the system, suspended flocs are large and heavy, thus making sludge highly concentrated.

From detention tank effluent is piped to a group of magnetic clarifiers, the number of which depending upon waste being treated.

Each clarifier has a revolving retention drum equipped with a permanent, stationary magnet. Undesirable solids and fibers contaminating the white water cling to the iron oxide particles which were mixed with the effluent. As the water passes over revolving magnetic drum, suspended matter is attracted to the face of drum due to presence of magnetic field. These are doctored off and accumulated. Clarified water is discharged from top of magnetic clarifier and may be dumped without fear of stream pollution.

Clarified effluent will have a 30 to 40% BOD reduction. Efficiency can be increased, depending upon waste being treated and chemicals used.

(Magnetic water clarification system is development of Black-Clawson Company, Dept. CP, Second and Vine Streets, Hamilton, Ohio . . . or for more information check CP 8199 on handy form which is located between pages 2 and 3.)

## High capacity, low cost seen with vibrating ball mills

three double units can be installed in  
same space as one 10½ x 14' mill

Fundamental tests, in progress for more than two years, indicate that higher capacities and lower costs can be expected with vibrating ball mills. Three double units can be installed in the same space as one 10½ x 14' conventional mill. These six vibrating mills have from two to three times the capacity for the same fine grinding as one large conventional mill. Other advantages will be reduced installation and maintenance costs.

This mill is primarily a fine grinding unit for both wet and dry materials, but indications are that it can be adapted to coarse grinding. The mills have been operated in closed and open circuit. It has been found that the capacity of a 42 x 42" vibrating ball mill, when grinding cement clinker (to a fineness of 95%-200 mesh) and operating in a combination open and closed circuit, has about the same capacity as that of a conventional mill 7' in diameter and 11' long (closed circuit with air classifier.)

Tests with this same size mill grinding taconite ore (to approx 70% minus 325 mesh; 8 to 10 mesh feed) with both cone and spiral classifiers, show a capacity of 22 tph which is about equal to that of an 8 x 10' conventional ball mill operating in closed circuit.

Also indicated is less ball wear per ton of taconite ground than in conventional mills. Vibrating units will have replaceable Ni-Hard end liners and inner and outer shells will be fabricated from special erosion-resistant steel plate.

"Work index" factors run about 10% lower in these mills, which means less horsepower per ton of grinding.

(Information on vibrating ball mills courtesy of Allis-Chalmers Mfg. Co., Dept. CP, PO Box 512, Milwaukee 1, Wisconsin.)

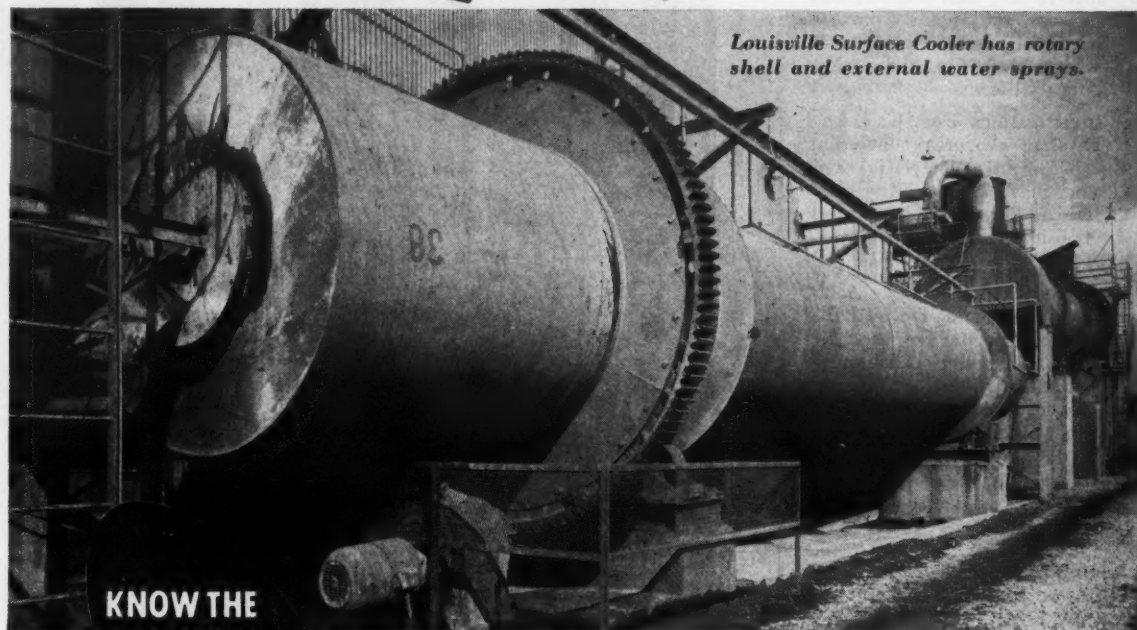
### Gives useful information on installing sanitary pumps

"Right" and "wrong" ways of installing and using positive displacement sanitary pumps are illustrated in 36-page handbook. Performance charts, operating data, and conversion tables for determining correct sizing and capacities are included. Several pages are devoted to graphs showing power and speed requirements for delivered capacities against various heads.

Reference handbook is available from Waukesha Foundry Co., Dept. CP, Waukesha, Wisconsin. When inquiring specify CP 8200 on handy form, pages 2 and 3.



## Louisville Cooler does satisfactory job at low cost for nationally known chemical manufacturer...



Louisville Surface Cooler has rotary  
shell and external water sprays.

KNOW THE  
RESULTS  
before you buy!

... cooling lumpy calcined material from 1800° Fahr. to 150° Fahr. for further processing. Gentle mechanical handling required to minimize decrepitation.

Each Louisville cooler is "job-fitted" to your special problem—to make your cooling operations effective—to assure dependability of performance that will make the cooler operation pay.

Call in a Louisville engineer for a complete cooling survey. Based on his experience he will recommend one of the three standard Louisville types, a modification, or an entirely new design. *The performance will be pre-determined. You'll know the results before you buy... and the results must be better! Write for complete information today.*

### 3 types of Louisville Coolers

- Surface Cooler
- Water Tube Cooler
- Atmospheric Cooler

#### Other General American Equipment:

Turbo-Mixers, Evaporators,  
Dryers, Dewaterers, Towers,  
Tanks, Filters, Pressure Vessels



### Louisville Drying Machinery Unit

Over 50 years of creative drying engineering

**GENERAL AMERICAN TRANSPORTATION  
CORPORATION**

Dryer Sales Office: Hoffman Bldg., 139 So. Fourth Street  
Louisville 2, Kentucky

General Offices: 135 South La Salle Street, Chicago 90, Illinois  
Offices in all principal cities

In Canada: Canadian Locomotive Company, Ltd.  
Kingston, Ontario

When inquiring check CP 8201 on handy form, pgs. 2-3



**Abstract 84 publications  
on fats and oils**

Technical publications covering phases of oil and fat technology published since 1941 by Dept. of Agriculture's Southern Regional Research Laboratories, have been abstracted in bibliography. The 84 publications include information on a variety of fatty products — modified fats, mono-, di-, and triglycerides, oils and fatty acids from cottonseed, peanuts, tung nuts, sesame seed, rice, and various minor oilseeds.

Investigations emphasized physical properties including expansibility, interfacial tension, plasticity, solubility, spectral and thermal properties, viscosity, and density.

Bibliography, "The Physical Properties of Fatty Acids, Glycerides, and Derivatives," is issued by the Southern Regional Research Laboratory, Southern Utilization Research Branch, Agricultural Research Service, 2100 Robert E. Lee Blvd., New Orleans, Louisiana.

**Saving in nickel comes  
with use of neglected  
low-Ni alloy . . .**

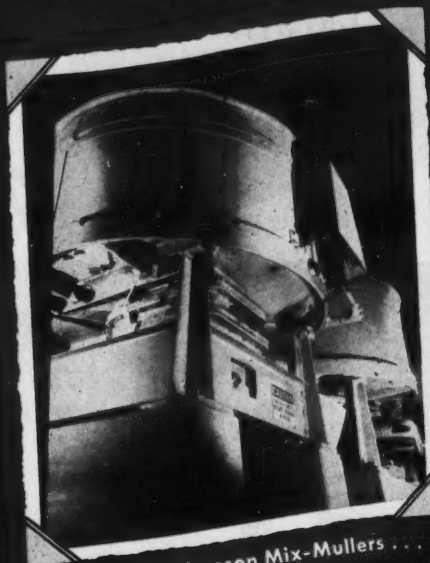
can sub for high-nickel alloys  
in temp range 1200 to 1600°F

Research sponsored by the Alloy Casting Institute, Mineola, N.Y., should result in savings of nickel in alloy castings. It has been found that a hitherto neglected alloy may substitute for alloys containing greater amounts of nickel.

This alloy, designated as HF grade containing about 20% chromium and 9% nickel, can be used effectively in place of HH grade (12% nickel) in the intermediate temperature range of 1200 to 1600°F.

Studies show that mechanical properties of this alloy are comparable to those of higher-nickel, heat-resistant alloys. On a pound-for-pound basis, this should mean a saving of about 25% in amount of nickel contained per casting.

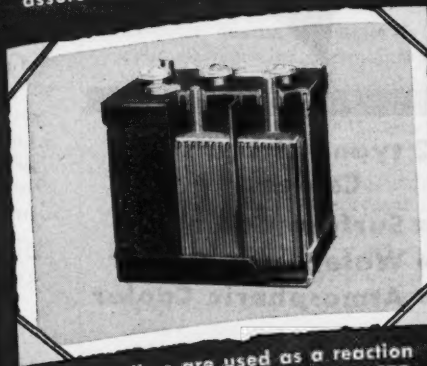
Investigations, covering a broad series of experimental alloys, disclosed that the most useful range



Here are two Simpson Mix-Mullers . . .

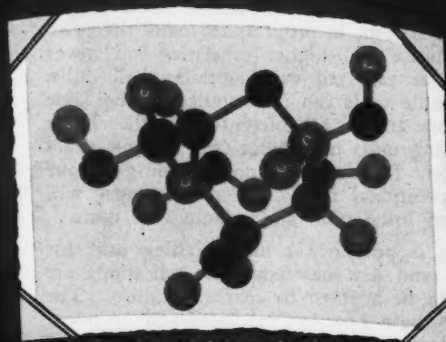


In mixing GRAPHITES, Mix-Mullers assure uniformity and absence of grit.



Mix-Mullers are used as a reaction vessel in preparing BATTERY PASTE.

# Yesterday's mixing



Uniformity and complete dispersal of elements is a necessity when mixing CATALYSTS.

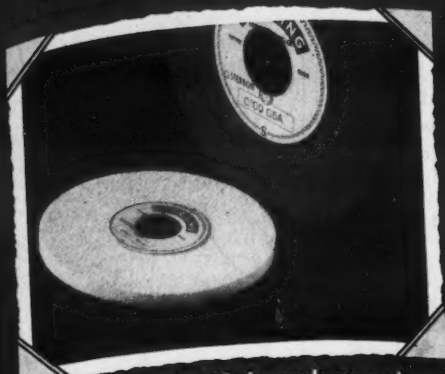


Only mulling assures complete dispersal of pigments and plasticizers so necessary for calendared PLASTIC items.



Preparing CHEMICAL REACTION COMPOUNDS is an intricate process requiring very intimate blending.

# problems... an album of experience with Simpson Mix-Mullers!



Mixing ABRASIVES demands rugged, long wearing mixers.



Simpson Mix-Mullers easily perform the difficult job of blending VITAMINS with BULK FEED.



A free, personalized mixing analysis in our laboratory will prove what a Simpson Mix-Muller will do on YOUR PRODUCT... write for details.

## SIMPSON MIX-MULLER® DIVISION

National Engineering Company  
(Incorporated)  
604 Machinery Hall Building  
CHICAGO 6, ILLINOIS



HERE'S A PAGE OUT OF OUR SCRAPBOOK  
OF SIMPSON MULLED PRODUCTS...

The feed manufacturer was wasting expensive vitamin concentrates through improper dispersal of a small amount of feed.

The battery producer needed a mixer that would handle corrosive acids safely.

The plastics producer was troubled with improper pigment dispersal.

These are but a few of the many problems solved... the many products mixed in Simpson Mix-Mullers. YOUR mixing problem may involve different materials... or you may not even recognize it as a mixing difficulty. Whatever it may be, if you are preparing dry, semi-dry or wetted materials, why not investigate what Simpson Mix-Mullers can do for your product or process.

Mixing is our business... our only business for over 37 years.



National Engineering Company

## IDEAS

is as follows: 19 to 23% chromium, 9 to 12% nickel, and 0.25 to 0.40% carbon. This composition has been designated as the HF alloy.

In general, mechanical properties of austenitic HF compositions in the 1200 to 1600°F range are comparable to those of higher-nickel alloys. At 1400°F, 100-hr rupture stress of a typical HF composition is about 14,000 psi.

HF grade, as cast, has satisfactory ductility as shown by an average elongation value of about 30%. After 24-hr exposure at 1400°F, elongation is approximately 17% — still adequately ductile.

Comparative elongation figures for higher-nickel HF grade are 20% as cast, and 10% after 24 hr @ 1400°F. Thus, HF grade not only conserves nickel, but also provides a material of superior ductility for intermediate temperature service.

(Information courtesy of Battelle Memorial Institute, Dept. CP, 505 King Ave., Columbus 1, Ohio)

## Sand kept out of drill in soil work...

frozen "needle" solves problem

Perforated drill points are used for injecting chemical mixtures into sand and silt soils to decrease their permeability. Use of dry ice to freeze the drill prevents sand from entering the point as it is driven to the desired depth.

Injection section of drill rod is placed into section of pipe casing and surrounded with dry ice. After casing is completely frosted, water is introduced into drill rod and allowed to freeze. When rod is fully frozen, it's removed from the ice, set into drill for driving.

Warm water is used to melt ice after rod has reached proper level. Solution is then pumped in.

(Information courtesy of Soil Testing Services, Inc., Dept. CP, 3529 N. Cicero Ave., Chicago 41, Ill.)

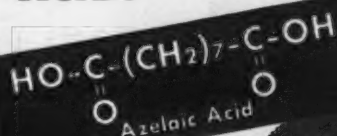
For more information on product at left, specify CP 8202... see information request blank between pages 2 - 3.



# LOOK

at this unique

## EMEROX® DIBASIC ACID!



...from Emery's New  
Ozone-Oxidation Plant

This new source of dibasic acid may be the answer to one of your tough problems . . . or it may be just the right chemical intermediate for that unusual application you've been thinking about.

Already it has unlimited potential use in plasticizers, alkyd resins, polyesters, polyamides, and synthetic lubricants. Further utilization as an economic replacement for higher-priced dibasic acids is also unlimited.

Take a look at the typical characteristics and composition of EMEROX 1110 Azelaic Acid:

Acid Value	560
Combining Weight	100
Melting Point	95-99° C
Color, F. A. C.	7
Specific Gravity @ 110° C	1.038
Azelaic Acid Content (C <sub>9</sub> )	87%
Other Dibasic Acids	13%

As a result of Emery's revolutionary ozone-oxidation process, EMEROX 1110 Azelaic acid is now available in commercial quantities.

See us at National Plastics Exposition  
Cleveland — June 7-10

Check this unique dibasic acid  
today — send for samples —  
mail coupon for literature!



Fatty Acids & Derivatives  
Phenol Plasticizers  
Tributyl Oils, Emulsifiers

Emery Industries, Inc., Carew Tower, Cincinnati, Ohio  
New York • Philadelphia • Lowell, Mass. • Chicago • San Francisco  
Cleveland • Ecclestone Chemical Co., Detroit  
Warehouse stocks also in St. Louis, Buffalo, Baltimore and Los Angeles  
EXPORT: 5035 RCA Bldg., New York 20, New York

EMERY INDUSTRIES, INC.  
Dept. CP-5, Carew Tower  
Cincinnati 2, Ohio

Please send me literature on  
Emerox 1110 Azelaic Acid.

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

## IDEAS

### Ten suggestions for insuring good emulsions . . .

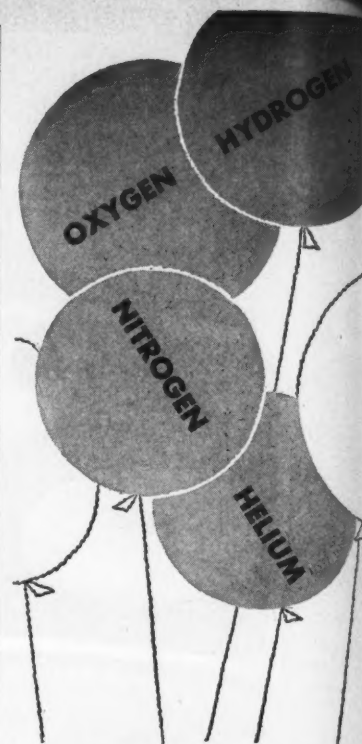
dispersion, temperature, stability and viscosity problems discussed

1. Emulsifier blends frequently give proper balance of oil- and water-loving groups within the emulsifier to achieve emulsion stability.
2. On oil-in-water emulsions, when adding high concentrations of blended emulsifiers, disperse emulsifiers in oil phase, add water slowly to mixture. After inversion point is reached, rate of addition can be increased.
3. In water-in-oil emulsions, add water to mixture of oil and emulsifier, then homogenize. Homogenization may not be necessary if small amount of hydrophilic emulsifier is used in addition to strong water-in-oil emulsifier.
4. Temperatures of both phases should be approximately the same at time of emulsification. If addition is endothermic, have internal phase about two degrees warmer than external phase. If waxes are present in the oil phase, emulsification temperature should be at least 10°F higher than mp of wax.
5. If melting of oil phase ingredients is necessary, it should be done without local overheating.
6. In oil-in-water soap type emulsions, with soap formed *in situ*, add alkali in solution to melted oil phase containing the saponifiable acid.
7. Avoid air entrapment in emulsion. Stability is reduced because emulsifier tends to migrate to liquid-air interface. Most common cause of air entrapment is vortex formation during emulsification. Vortex formation can be eliminated by putting a baffle in the mixing vessel.
8. Anti-oxidants and preservatives should be added when sterile conditions are not maintained throughout manufacture and storage.
9. Viscosity can be lowered by increasing proportion of external phase, decreasing its viscosity, or adding a hydrophilic surface active agent. Viscosity can be increased by decreasing proportion of external phase, adding thickeners to external phase, or including higher melting compounds in the internal phase.
10. Even small changes in raw materials or process variables could upset emulsion stability or other important characteristics.

(Information through courtesy of Atlas Powder Co., Dept. CP, 904 Market St., Wilmington 99, Delaware.)

### For a guide to ideas . . .

You'll find what you need in the handy Product Directory on pages 213 to 216. All products and processes are listed there.



## MAGNOLIA AIRCO

### supplies the southwest!

Magnolia Airco gases and liquids . . . rare gas mixtures . . . xenon . . . krypton . . . and neon conform to specification. You can count on their purity and consistent uniformity—every shipment packaged to your requirement! Consult your nearest Magnolia Airco office for full details.



## AIR REDUCTION MAGNOLIA CO.

A Division of Air Reduction Company, Incorporated  
Beaumont • Corpus Christi • Dallas • El Paso  
Fort Worth • Hobbs • Houston • Oklahoma City  
San Antonio • Shreveport • Tulsa • Wichita Falls  
Southwestern Headquarters for Oxygen, Acetylene  
and Other Gases . . . Carbide . . . Gas Welding  
and Cutting Machines, Apparatus and Supplies  
. . . Arc Welders, Electrodes and Accessories.

at the frontiers of progress

you'll find



When inquiring check CP 8204  
on handy form, pgs. 2-3

CHEMICAL PROCESSING

When inquiring check CP 8203 on handy form, pgs. 2-3

### Field tests of chemical as weed control agent are encouraging

Recent field tests conducted by du Pont in Kansas, Florida, Texas, and California show promise for 3-phenyl-1,1-dimethylurea in controlling deep-rooted perennial weeds. Experimenting on field bindweed, Johnson, Bermuda, and quack grasses, and Canada thistle, amounts of agent ranging from 10 to 80 pounds/acre were found sufficient, depending upon locale, subsequent rainfall, and specific weed. Soil persistence in test areas was from 10 to 16 months.

Compound is white, crystalline. Melting point is 127°-129°C. Solubility in water (@ 24°C) is 3 gm/l. Chemical is not presently available for farm use.

(3-Phenyl-1,1-dimethylurea is a development of E. I. du Pont de Nemours & Company, Incorporated, Department CP, Wilmington 98, Delaware.)

### New jet engine oils handled by plastic hose . . .

capable of resisting high temps and corrosive action

Development of new synthetic oils to stand up under temperature extremes of jet aircraft operation created a materials handling problem. Conventional fluid-carrying materials were not able to withstand high temperatures and corrosive action encountered.

Fluorocarbon hose has been found to possess the necessary chemical and physical properties to solve the problem. The hose is also expected to eliminate frequent replacement.

(Plastic hose is a product of Resistoflex Corp., Dept. CP, Belleville, N. J. . . . or for more information concerning manufacturer's product, reader may simply check CP 8205 on the convenient Reader Service slip which is located between pages 2 and 3.)

For more information on product at right, specify CP 8206 . . . see information request blank between pages 2 - 3.

# DESIGN and PRODUCTION NEWS

FOR PLASTICS AND MATERIALS ENGINEERS

Published by TECHNICAL SERVICE, Chemical Manufacturing Division, The M. W. KELLOGG Company

APRIL-MAY 1954

## Kel-F® Keeps Jet's Fuming Acid Line Secure Under Severe Stress

Fuming nitric acid vapor, operational shock and thermal cycling can't loosen the grip of these special lock nuts fitted with inserts of "Kel-F" plastic.

Viciously corrosive fuming nitric acid cannot attack chemically-inert "Kel-F". Once tightened, nuts remain tight, in spite of sub-zero to 165°F variations of temperature, because of the dimensional stability of the plastic inserts. Engine vibrations or accidental blows won't crack or weaken the "Kel-F" which has exceptional impact and compressive strength. Exposure to moisture doesn't affect the plastic's form or properties . . . preventing failure from swelling, shrinkage or softening.

The Elastic Stop Nut Corporation of America, Union, N. J., produces these fasteners using corrosion-resistant alloys with inserts injection-molded from "Kel-F" . . . in sizes from #10 to 3/8".

**For further information ask for Application Report C-114**

\*Trade-Mark Elastic Stop Nut Corporation of America

For complete information regarding any item mentioned in DESIGN AND PRODUCTION NEWS, ask for detailed APPLICATION REPORTS, write




## Magnetic Stirring Bars Sealed in Kel-F® to Stop Corrosion and Breakage

A vacuum-tested casing of "Kel-F" permits these metal bars to be used indefinitely to "mix" highly corrosive acids, alkalis, solvents and peroxides—at from minus 200°C to plus 200°C—without corrosion or breakage. The fluorocarbon "skin" cannot crack or chip. Non-porous and non-absorbent, the covering is virtually self-cleaning, can even be sterilized.

Three sizes of stirring bars are now made by the Arthur H. Thomas Company of Philadelphia, Pa., by sealing cylindrical permanent magnets into extruded tubing. Extruded from unplasticized "Kel-F" Grade 300 by the Plax Corporation of Hartford, Conn.

**For further information ask for Application Report C-115**

**VISIT KEL-F POLYMER EXHIBIT  
at the BASIC MATERIALS SHOW  
May 17-20 — Chicago, Ill.**

Technical Service  
**CHEMICAL  
MANUFACTURING  
DIVISION**  
THE  
**M. W. KELLOGG  
COMPANY**  
P. O. Box 469, Jersey City 2, N. J.  
or offices in Boston, Chicago, Dayton,  
Los Angeles and New York  


® Registered trademark for The M. W. Kellogg Company's trifluorochloroethylene polymer products.

KEL-F

FLUORO  
CHLORO  
CARBON  
PLASTIC

KEL-F

FLUORO  
CHLORO  
CARBON  
PLASTIC

KEL-F

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KEL-F

FLUORO  
CHLORO  
CARBON  
PLASTIC



# AGILENE (POLYETHYLENE)

# AGILIDE (NON-PLASTICIZED) (POLYVINYL CHLORIDE)

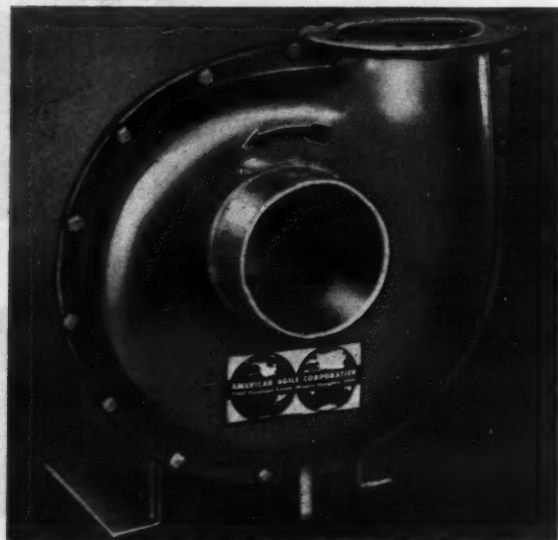
## "Barriers AGAINST CORROSION"

PLASTIC FABRICATIONS FOR  
THE CHEMICAL HANDLING INDUSTRIES

MODERN MATERIALS OF CONSTRUCTION



Agile's high-grade modern thermoplastic construction materials — AGILENE and AGILIDE — fabricated by a unique combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered installation.



Fabricated entirely from AGILIDE (non plasticized polyvinyl chloride), they are corrosion proof throughout. Type "A" fans are light in weight and of all welded and formed construction. Designed in strict accordance with aerodynamic principals and accepted industrial standards. They offer a complete solution for conveying corrosion fumes.

Sizes up to 3,700 cfm are available and larger sizes upon request. AGILENE (polyethylene) fans (Type "K") are also available.

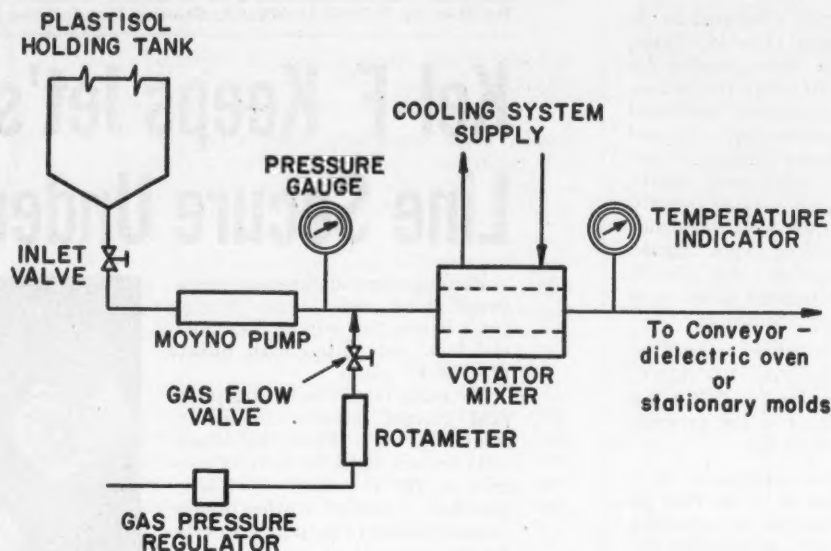
*American Agile Corporation*

Plant and General Offices • 5461 Dabney Rd., Maple Heights, Ohio  
Marketing Offices • P. O. Box 100 • Bedford, Ohio

DEPT. C-1

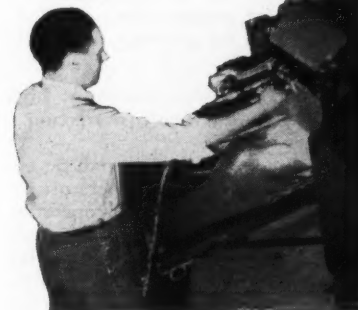
When inquiring check CP 8207 on handy form, pgs. 2-3

### ideas



Flow diagram illustrating process for making foamed plastisol

## continuous foaming and curing process makes foamed vinyl plastisol by gas absorption



**Product is soft, elastic, will not burn, won't harden, and compares favorably with price of foam rubber**

Soft, flexible foam that "breathes" can be produced and molded continuously as a cushion backing for textiles and other materials by a method employing plastisols based on vinyl resins. The material is easy to fabricate, and is reported to be comparable to foam rubber in price.

Equipment for the process is said to cost less than one-sixth of that needed for producing foam rubber. Foam is practically odorless, has good tensile strength, will not harden with age, and has resistance to tear and abrasion. It will scorch under fire but will not burn. Material "breathes" because its physical structure is composed of millions

of interconnecting cells formed by the gas employed in process. Foam densities can be produced varying from 6 to 30 lb/cu ft in almost any degree of hardness — a range comparable to lightweight foam rubber up to the hardest flexible sponge rubber. Properties can be controlled by varying plastisol formulation or process technics.

In the process a Girdler Votator Foamer continuously mixes the plastisol with gas. Both can be metered accurately into the mixing head (plastisol by means of Moyno pump, and gas by rotameter). Depending on the density desired, production rates varying between 150 and 350 lb/hr are achieved with an average size Votator. Larger units can produce up to 1000 lb/hr. Increased gas retention lowers foam density and is obtained by cooling the mixture in the mixing head with ammonia from a compression cooling system.

Expanded foam discharges from Votator continu-

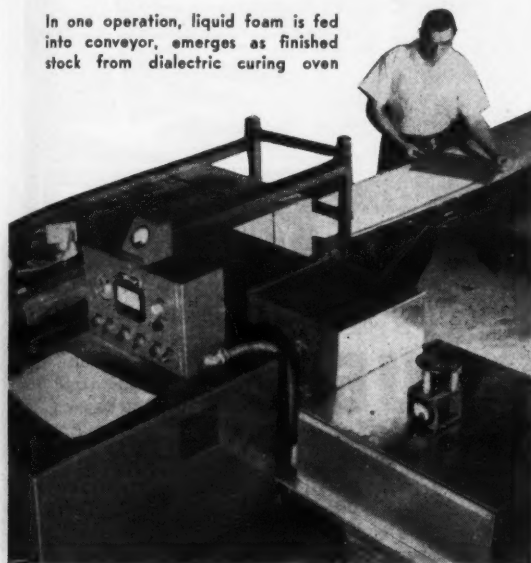
ously through hose and nozzle into open or closed molds, or directly onto a conveyor belt, where it can be rapidly cured in sheet form by a Girdler Thermex dielectric oven. Thus, in a single operation, the liquid foam is fed into the conveyor and emerges as finished sheet stock.

Equipment can be made to cure foam continuously or in stationary molds at almost any desired rate or thickness in widths up to 60".

Foamed plastisol cures at about 250°F. Absence of pressure, shrinkage, and adhesion to mold permits casting and curing in lightest molds, even cardboard. No mold release agents are needed. A block 3" thick can be completely cured in 3 min.

(Photographs courtesy of Bakelite Company, a Division of Union Carbide and Carbon Corporation, 260 Madison Ave., New York 16, N. Y.)

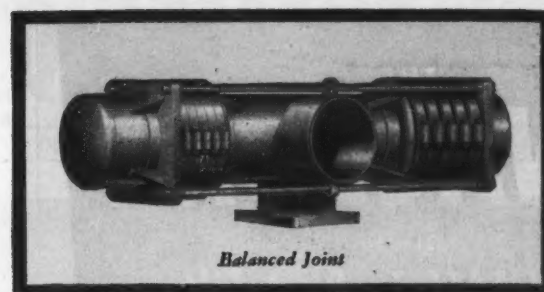
In one operation, liquid foam is fed into conveyor, emerges as finished stock from dielectric curing oven



(Elastofoam process is licensed for production by Elastomer Chemical Corporation, Dept. CP, 212 Wright St., Newark 5, N. J. . . . or check CP 8208 on handy form, pages 2 and 3.)



Texture and uniformity of cell structure is shown in close-up of block of low-density vinyl foam

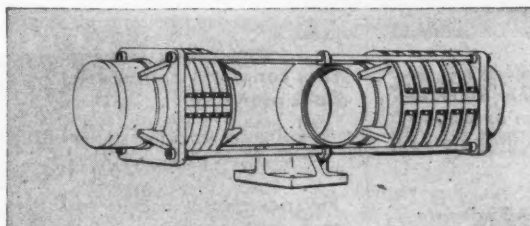


Balanced Joint

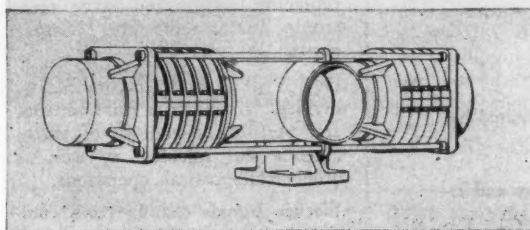
ELIMINATE END THRUST

AT PIPE INTERSECTIONS . . . .

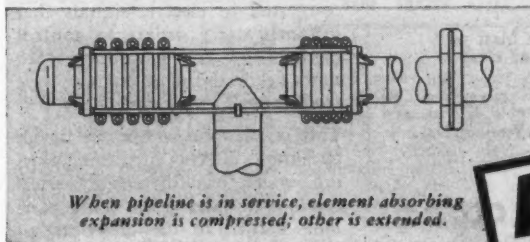
## THE *Corruflex* BALANCED JOINT



Balanced Joint Before Absorbing Expansion.



Balanced Joint After Absorbing Expansion.



When pipeline is in service, element absorbing expansion is compressed; other is extended.

EXPANSION JOINTS • HEAT EXCHANGERS • TRAPS

• Buying an expansion joint from ADSCO is like shopping in a super-market. Everything you need is under one roof. Offering the world's most complete line of both slip and packless expansion joints, ADSCO is the only manufacturer able to supply the right joint for every purpose. ADSCO's complete line is backed up by an engineering service which since 1877 has found exact solutions to customers' special problems.

An example of ADSCO's versatility is the Corruflex Balanced Joint illustrated here. This packless expansion joint is designed to accommodate axial motion and eliminate end thrust at pipe intersections. The rods tie the joint ends together, thereby transmitting the end thrust to a distant point where adequate anchorage is available. The joint thus requires only the equivalent of an intermediate or stabilizing anchor.

So when you're shopping for expansion joints, come to ADSCO first. You won't have to look elsewhere . . . Call your ADSCO representative or write for Bulletin 35-51A.



STRAINERS • SEPARATORS • METERS

**AMERICAN DISTRICT STEAM COMPANY, INC.**

GENERAL OFFICES

NORTH TONAWANDA, NEW YORK

PLANTS: NORTH TONAWANDA, N. Y., AND RICHMOND, CALIF.

When inquiring check CP 8209 on handy form, pgs. 2-3



# THE DYNACLONE

PATENTED

The ULTIMATE in Dust Filters



## HOW IT OPERATES

- Dust laden air is drawn in from the dust sources as indicated by the shaded arrows.
- It is diffused into the dust chamber by the baffle plate.
- It is then drawn through the fabric of the filter bags and is cleaned as shown by the clear arrows.
- Clean air passes out of the case and goes to the suction fan.
- Concurrently, the traveler moves back and forth across the dust wall registering successively with one bag at a time.
- The suction which exists in the dust chamber draws a blast of atmospheric air through the bag in reverse directions and cleans that bag. (No shaking.)

Control your industrial dust better, for less — with the Sly Dynaclone. May we explain how?

SEND FOR BULLETIN NO. 102

## THE W. W. SLY MANUFACTURING CO.

4754 TRAIN AVENUE • CLEVELAND 2, OHIO  
New York • Chicago • Philadelphia • Syracuse • Detroit • Buffalo  
Cincinnati • St. Louis • Minneapolis • Birmingham • Los Angeles • Toronto

**SLY**

PIONEERS & LEADERS  
in INDUSTRIAL DUST CONTROL

When inquiring check CP 8210 on handy form, pgs. 2-3

## IDEAS

### Nylon, rubber bonded in one operation . . .

technic cuts costs as much as 50% over previous method

Recently developed process for bonding rubber to nylon bearings reduces total cost of finished part as much as 50%.

Formerly, metal sleeves were molded into rubber, an oilite bearing inserted, and the rubber surfaces ground to dimensions.

Injection-molding and bonding within close tolerances are now done in one operation.

(Information courtesy of Dept. KP, Minnesota Rubber and Gasket Company, Department CP, 3630 Wooddale Avenue, Minneapolis 16, Minnesota.)

### Tiny computer component does many jobs . . .

plug-in device smaller than 1/2 pack of cigarettes

Electric plug-in device smaller than half a pack of cigarettes, and having no moving parts, is replacing complicated, large, electronic analog computer components.

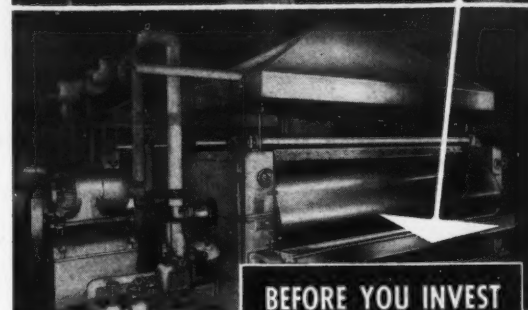
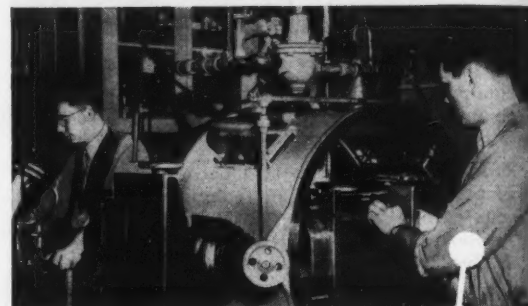
Device adds, subtracts, multiplies, divides, integrates, differentiates, and performs operations of vector algebra and calculus, as well as other mathematical operations.

Electric signals coming from computer's sensing elements are converted to heat, intermixed, and reconverted to electric signals that instantly carry orders to control mechanisms for adjustments 20 times faster and more accurate than from human reactions.

This is all done within the device by simple electric circuits employing wires of different electrical conductivity and other static parts long known to the electrical industry. Gears, bearings, rotors, and shafts heretofore necessary in computing devices are not required.

Immediate use will be with Armed Forces for guiding missiles and aiming and firing radar-controlled guns. Low cost, when put into mass production, may one day make component available for every-day use for controlling tem-

## BUFLOVAK gets the answer for you here . . .



**BEFORE YOU INVEST  
YOUR MONEY HERE!**

## pre-testing shows the advantages of BUFLOVAK DOUBLE DRUM DRYERS

Liquids converted directly to dry products by a continuous, low-cost process! That's the money-saving job that BUFLOVAK Double Drum Dryers are doing in hundreds of plants. New uses and products constantly are being found. Does a similar opportunity exist in your plant? The BUFLOVAK Research Laboratory will gladly help you find out.

By pre-testing on a semi-plant scale recommendations are based on facts. You will get the exact type dryer that will cut costs . . . and make a better product. Frequently, new drying techniques are developed. There's a *best* type dryer for every purpose.

The full story of BUFLOVAK Processing Equipment reaches into many industries. There are all types of dryers, evaporators, kettles, and equipment for doing a better job in processing chemicals and foods. A request on your company letterhead will bring catalogs along with any information you may need.

## BUFLOVAK EQUIPMENT DIVISION

OF

BLAW-KNOX COMPANY



1645 Fillmore Avenue  
Buffalo 11, New York

When inquiring check CP 8211 on handy form, pgs. 2-3

CHEMICAL PROCESSING

perature based on relative humidity, running a car, or sailing a boat.

(Sub-miniature analog computer component is development of Arma Corporation, subsidiary of American Bosch Corporation, Dept. CP, Roosevelt Field, Garden City, New York.)

### Synthetic dust bags tested in spray dryer . . .

polyester, Vinyon N, Dynel, and acrylic fiber bags used

Dust bags made of four different synthetic fabrics were recently tested for serviceability in spray dryers by a Niagara Falls producer of agricultural chemicals. Material being dried was an unstable alkyl-aryl herbicide. Bags composed of polyester fibers, Vinyon N, Dynel, and an acrylic fiber were tested. Cotton dust bags used previously in the plant failed in two to three weeks.

Bag chamber of each spray dryer contained four sections of 60 bags each. Temperature was as high as 220°F, and dust pH as low as 4. Sixty 7-foot bags of each fabric were installed in one dryer and run simultaneously. Duration of test was 91 days for all the fabrics.

Polyester fiber bags lasted 48 days. Bags of Vinyon N, Dynel, and acrylic fiber lasted out the test, but four Vinyon N bags and three acrylic fiber bags were found to be unserviceable at the end of the 91st day.

Dynel bags, manufactured by Flaherty Filter Fabrics, were all serviceable at end of test. Marked discoloration was noted on acrylic and Vinyon N bags, so all bags were washed before they received a final inspection.

(Dynel fiber is product of Textile Fibers Department, Carbide and Carbon Chemicals Company, Division of Union Carbide and Carbon Corporation, Department CP, 30 East 42nd Street, New York 17, New York.)

For more information on product at right, specify CP 8212 . . . see information request blank between pages 2 - 3.

# PROCESS EQUIPMENT NEWS

PUBLISHED BY FABRICATED PRODUCTS DIVISION, THE M. W. KELLOGG COMPANY

APRIL-MAY 1954

## 3,360 Red Brass Tubes for This Condenser

Shown on one of Kellogg's boring mills (below) where the gasket face is being machined, this is a channel for one of four sections of a prefractionator condenser currently underway for a southwestern petroleum refinery.

Each bundle of the condenser will contain 840 tubes,  $\frac{3}{4}$  inch in outside diameter by 16 feet in length. The water available for industrial purposes in the particular area where the condenser will be used is especially corrosive. To offset this, specifications call for red brass as the material for the tubes, this alloy having proved by experience to give the most effective pro-



tection against corrosion in the locality involved.

Tube sheets for the condenser will be of steel, clad with naval brass. Shell, shell cover, and channel are of steel. Design temperature is 200°F. on the shell side and 150°F. on the tube side.



## Big Condenser Will Hold Pressure Drop to 5mm. Maximum

The drip-type condenser shown above in progress in Kellogg's shop has been designed to hold pressure drop on the shell side to the exceptionally low maximum of 5 mm. of mercury. Consisting of two sections, the unit will condense naphtha vapors and steam on the shell side and heat a petroleum distillate on the tube side. Operating pressure on the shell side will be 65 mm.,

and 150 psi. on the tube side.

Representative of one of the more complex types of exchanger units Kellogg is experienced in building, in addition to all the conventional types, this condenser is designed with an obround nozzle to spread the incoming vapors over the entire length of the tube bundle, thus providing for pure cross-flow heat transfer.

## 44,000-lb. Reactor for New Chemical Process

Similar in design to units refiners use in transforming certain petroleum gases into polymer gasoline, this big reactor (right) will shortly become an important part of a new chemical plant now building on the East Coast. The plant will be the first in this country to manufacture phenol from cumene, an intermediate material which in turn is obtained from benzene and propylene. This particular unit is the vessel in which the reaction to produce cumene will be carried out.

The tubular reactor is  $3\frac{1}{2}$  feet in internal diameter by 35 $\frac{1}{2}$  feet in length, and is fabricated of high-tensile carbon steel, 1 $\frac{1}{2}$  inches thick. When completed, it will tip the scales at some 44,000 pounds. The unit is designed for an internal pressure of 990 psi, and temperature of 510°F.



For further information, specify  
CP 8212 on inquiry card

**FABRICATED  
PRODUCTS DIVISION  
THE  
M. W. KELLOGG  
COMPANY**

220 Broadway, New York 7, N. Y.  
or offices in Jersey City, Buffalo,  
New Orleans, Tulsa, Houston, Toronto,  
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EXCHANGERS



THIN WALL  
ALLOY  
PIPING



CLAD STEEL  
VESSELS



CONDENSERS



FRACTIONATING  
TOWERS



PRESSURE  
PIPING



DIGESTORS



COOLERS

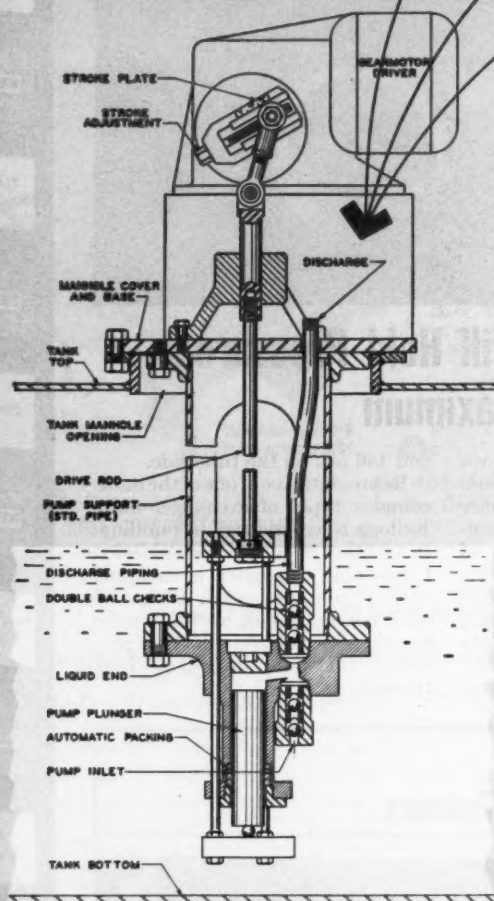


**CONTROLLED  
VOLUME PUMPS  
ARE  
FLOW-CONTROL  
INSTRUMENTS**

➔ **no leakage to  
atmosphere**

➔ **no diaphragm**

➔ **no contamination**



**MERSEMETRIC® . . .  
the new controlled volume pump  
for submerged operation**

Here's a new member of the family of Milton Roy Controlled Volume Pumps. The Mersemetric pumps by direct volumetric plunger displacement, using the exclusive double ball-check on both suction and discharge. Simple and compact, this new pump eliminates the need for a diaphragm. As a result, there can be no fluid contamination. Since Mersemetric is submerged in the fluid being pumped, there can be no leakage to atmosphere.

**TYPES** *Capsulated or drop-in-tank*  
**CAPACITIES** *3 milliliters per hour to 400  
gallons per hour*

**MAXIMUM PRESSURE** *To 1000 pounds per square inch (psi)*

**MATERIALS** *Full alloy selection*

**DRIVE** *Air or electric motor*

**CAPACITY REGULATION** *Manual or automatic and fully  
adjustable while in operation*

**USE** *As single units in integrated pump-  
ing systems or as final control  
elements in process instrumentation*

For complete details, write today, for Bulletin 1153-B.

The MERSEMETRIC® Controlled Volume Pump is designed to eliminate leakage of corrosive or expensive liquids by being submerged in the liquid being pumped. One of its specific applications is pumping concentrated sulphuric acid directly from the main storage tank to point of application, eliminating intermediate tankage or handling by personnel.

**MILTON  
Roy  
COMPANY**

1354 E. MERMAID LANE • PHILA. 18, PA.

*Manufacturing Engineers*

CONTROLLED VOLUME PUMPS AND AUTOMATIC CHEMICAL FEED SYSTEMS

Engineering representatives in the  
United States, Canada, Mexico, Europe,  
Asia, South America and Africa.

\*Patent Applied For

When inquiring check CP 8213 on handy form, pgs. 2-3

**IDEAS**

**Ice, snow shoveling eliminated  
by electric heating cable . . .**

protects pipes, roofs, and other exposed locations

Plastic-covered electric heating cable effectively protects pipelines, sidewalks, roofs, and other exposed locations from ice, snow, and sub-freezing temperatures.

Economical use results if installation is made during normal maintenance periods or at time of new construction, and if cable is operated only when weather conditions warrant.

Cable was recently wrapped around a 150-foot section of water pipe attached to underside of bridge crossing Allegheny River — a location which was inaccessible for any other heating method. Before application, water had been freezing in last 55 ft of travel. Energizing the 18-kilowatt installation, when weather conditions require it, results in continuous supply of water, even at times of low flow.

(Chromalox Thermwire is product of Edwin L. Wiegand Company, Dept. CP, 7517 Thomas Blvd., Pittsburgh 8, Pa. . . or for more information check CP 8214 on handy form, pages 2 and 3.)

**Continuous ion exchange  
by moving resin bed  
looks practical . . .**

appears to have economic edge over fixed bed process in removal of ions

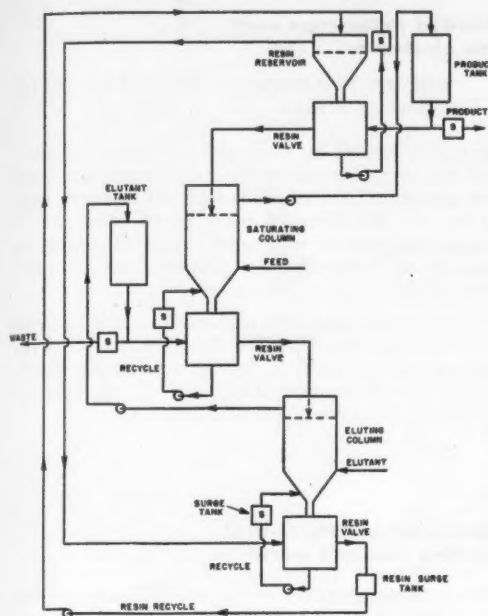
Recent engineering and economic evaluation of moving and fixed bed ion exchange processes indicates that the continuous countercurrent column is very attractive for industrial use. In this type of unit, contact between resin and solution occurs in a dense bed of resin as it moves through the column.

Hypothetical commercial installations have been designed by Stanford Research Institute to compare the continuous column, the customary fixed bed, and the equilibrium stage contactor. Both the separation and removal of ions were considered.

The continuous column proved more economical than the fixed bed for all cases of ion removal regardless of product specifications (purities). When throughputs were increased, unit cost dropped for both processes, but it dropped more for the continuous process. Thus, the continuous column is even more economical at high feed rates.

This points to a use for the continuous moving bed process in cases where ions are to be removed from a solution on a large-scale basis. Specifically it appears to be most promising, either because of improved products or reduced cost in the demineralization of brackish waters, large-scale water-softening, boiler water preparation, de-ionization of organic solutions, and recovery of metals from plating waste.

In the case of ion separation, the continuous column method would be less expensive than the fixed bed



Flowsheet of moving bed process designed for Stanford Research Institute's evaluation. Not shown is proposed continuous spectrophotometer with flame attachment, to be used on an effluent sidestream for controlling resin flow rate through system. No specific provision was made for recovering regenerant, but adequate cost for such recovery was allowed

if a single column would be sufficient to obtain the degree of separation desired. However, the fixed bed system would be best if a cascade of several continuous columns would be needed.

The equilibrium stage contactor is not very adaptable to commercial operation because it is complex equipment-wise and has the inherent disadvantages of intermittent operation. This leads to high equipment and operating costs. The apparatus probably will prove useful in experimental evaluation of proposed countercurrent ion exchange systems where it can provide design data quickly and accurately.

The Stanford experimental continuous column was 4" diam and made of glass. Resin bed passed downward while feed solution entered at bottom of column, flowed upward through resin bed, and overflowed at top. Unique resin transfer and dewatering valves introduced resin to top of column and removed it from the bottom.

At low solution flow velocities, most favorable resin-solution contact was obtained with an oscillating device that imparted a jiggling motion to the resin bed and reduced channeling. At higher velocities—those of commercial interest—good contact was obtained without any such mechanical device.

The ion-resin system used in the experimental program to obtain design data was lithium, potassium, and hydrogen ions, exchanging on Chempro C-20 sulfonated polystyrene resin, with total metal ion concentration at about 1500 ppm.

(Work was done by Stanford Research Institute, Stanford, California.)

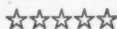
## General Mills Provides Amine Source☆☆☆☆☆Resin Blends Show Coating Benefits☆☆☆☆☆Aliphats Cut Buffing Compound Cost

**Fatty Amine Users** are now offered a new source of continuous amine supply by General Mills.

General Mills has fatty amines for either direct use or for further processing . . . readily available in drum or carload lots. These amines are processed at the General Mills chemical plant in Kankakee, Illinois, where constant quality and uniformity are guaranteed by high-standard automatically controlled processes.

A reliable, well-established firm with the best of technical personnel . . . plus top research and production facilities . . . General Mills produces a variety of Alamines (fatty amines), Alamacs (fatty amine acetates), and Alitriles (fatty nitriles).

For further information on General Mills Fatty Amines, please mail the coupon below.



**Decorative and Protective Coatings** got a new boost when Polyamide and epoxy resins were blended recently. These thermosetting blends proved excellent for coating collapsible metal tubes, foil, paper, machinery, masonry or concrete, and for other important applications.

Polyamide-epoxy resin coatings display an unusual combination of adhesion, flexibility, hardness and impact resistance. They are high-gloss coatings with excellent chemical resistance to both alkali and acid.

You can apply these new coatings by spray, dip, roller-coat or brush methods, and can either air dry or bake them. However, you get approximately a baked-enamel finish by merely air drying at room temperature. They "dry rapidly to handle," and may be recoated in a few hours. These coatings cure primarily without oxidation, so thicker films may be applied.

General Mills recommends either Polyamide Resin 100 or 115 for these coating blends with epoxy resins. Polyamide Resin 100 has superior resistance to acids while Polyamide Resin 115 has superior resistance to solvents. Both are outstanding in alkali resistance and flexibility. They are the latest developments in a rapidly advancing field. For more information, mail the coupon.



**All Buffing Compound Manufacturers** want to lower raw material costs. That's why General Mills offers a variety of products which may be used economically in buffing compounds—all closely controlled to insure constant uniformity.



The chemist at work on the vacuum coating unit and electron microscope, above, illustrates the research that accounts in part for General Mills' rapid success as a chemical supplier.

For example, greatly reduced costs may be obtained by using General Mills Vegetable Oil Pitches to extend your fatty acids. We suggest you try blends of pitch with Aliphats 7-C or 7-R (hydrogenated tallow acids) or Soap Acids No. 4 (a low cost high palmitic acid product). Aliphats 7-C and 7-R are also used readily as substitutes, in whole or part, for hydrogenated marine fatty acids.

Or, try General Mills Aliphath (fatty acid) 6-A, a special mixture of palmitic and stearic acids. This is a non-crystalline type, particularly suited for all applications where a tough, hard, waxy buffing compound is desired. Aliphath 6-A offers good shrinkage without cracking when melted and cooled.

On the other hand, the specially processed, fractionally distilled saturated fatty acid, Aliphath 6-BW (comparable to triple pressed commercial stearic acid) shows little shrinkage when melted and resolidified. Less costly Aliphath 6-C, with saturated acid ratio of approximately 60% palmitic and 40% stearic acid, has good stability and will perform effectively and economically where the lighter color of double and triple pressed types is not required.

General Mills manufactures these and other fatty acids for buffing compounds. If you would like additional information, please mail the coupon below.

There is an ALIPHATH for your specific need.

# General Mills

## CHEMICAL DIVISION

KANKAKEE, ILLINOIS

Please send me additional technical information for the products checked below:

☐ Fatty Amines ☐ Polyamide Resins  
Aliphats: ☐ 6-A ☐ 6-BW ☐ 6-C ☐ 7-C ☐ 7-R

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

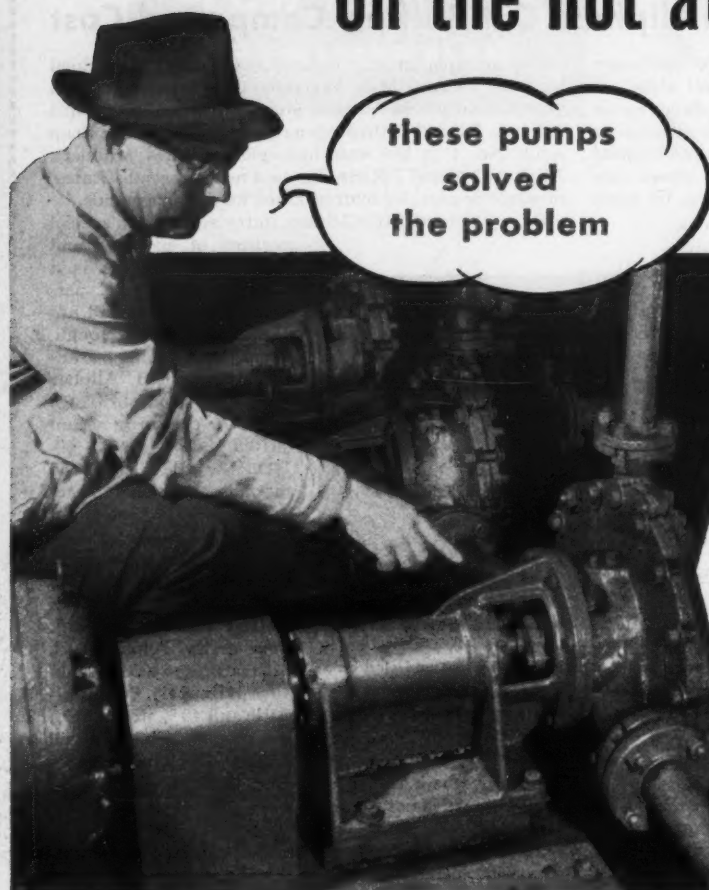
City \_\_\_\_\_ State \_\_\_\_\_

*progress thru research*

When inquiring check CP 8215 on handy form, pgs. 2-3



# No More Leakage on the hot acid line...



these pumps  
solved  
the problem

## Why this A-C pump does not leak

These process pumps have *Equeiseal* stuffing box. This is an auxiliary impeller which produces a low pressure area in front of the packing. This low pressure area prevents the liquid from entering the packing. Equipped with an *Equeiseal* stuffing box, an A-C pump will actually run without packing and not leak. Pumps also are available with standard stuffing box or mechanical seal. Each application is individually engineered.

Allis-Chalmers process pumps are available in a wide choice of materials to handle many types of abrasive or corrosive material at temperatures up to 250 F.

Three Type PESOR, 100-gpm pumps. 50-ft head at 1750 rpm.

**Tennessee Products and Chemical Corp.**, Chattanooga, Tenn., solved a tough pumping problem with Allis-Chalmers process pumps. Previous pumps used for sulphate recovery leaked badly. They were a constant source of packing and mechanical seal trouble. In addition, the leaking chemical shortened the life of the surrounding equipment. Production of the entire recovery system depends on these pumps. Every stop lowers production...boosts costs. Then Allis-Chalmers process pumps were

installed. They pump hot acid with ammonium sulphate (sand sized particles) 24 hours a day, 7 days a week. There is no leakage... packing and seal trouble is gone... maintenance costs are cut sharply.

For full information on Allis-Chalmers pumps and how they can help you with your pumping problems, call your local A-C representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 08B6615.

A-4230

*Equeiseal* is an Allis-Chalmers trademark.

# ALLIS-CHALMERS



When inquiring check CP 8216 on handy form, pgs. 2-3

## IDEAS

### Molded nylon caps used for electrodes...

improves performance of industrial and lab pH measuring devices

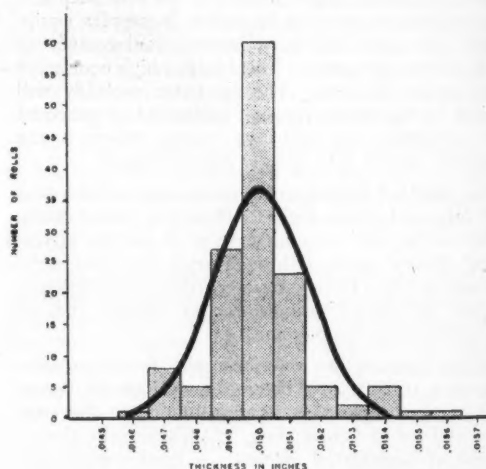
In tests conducted by Leeds and Northrup Co., Philadelphia, nylon-capped electrodes were boiled steadily for nine months in solutions with pH's varying from 3 to 14. No effect on the material other than a slight discoloration was noted. Such electrodes are used in pH controllers for industrial measurements and pH indicators for laboratories.

(Caps for reference electrodes were molded by Leeds and Northrup Co. from Du Pont Nylon. For more information contact E. I. du Pont de Nemours & Co., Dept. CP, Wilmington, Delaware... or check CP 8217 on handy form, pages 2 and 3.)

### Statistical quality control = getting money's worth

There is one reason for statistical quality control in chemical processing: getting your money's worth! SQC's chief concern is "identification of assignable variations against the background of inherent variation." In other terms, this means finding out when product variation is due to chance and when it is due to a fault of the process, raw material, etc.

An example of probability laws at work, the plot of "Number of rolls" against "Thickness in inches" shows how actual measurements confirm the "normal distribution curve." This curve has been superimposed on the gray areas which show actual meas-



urements obtained in tests. Actually the excessive height of center area also indicates operator bias in determining results.

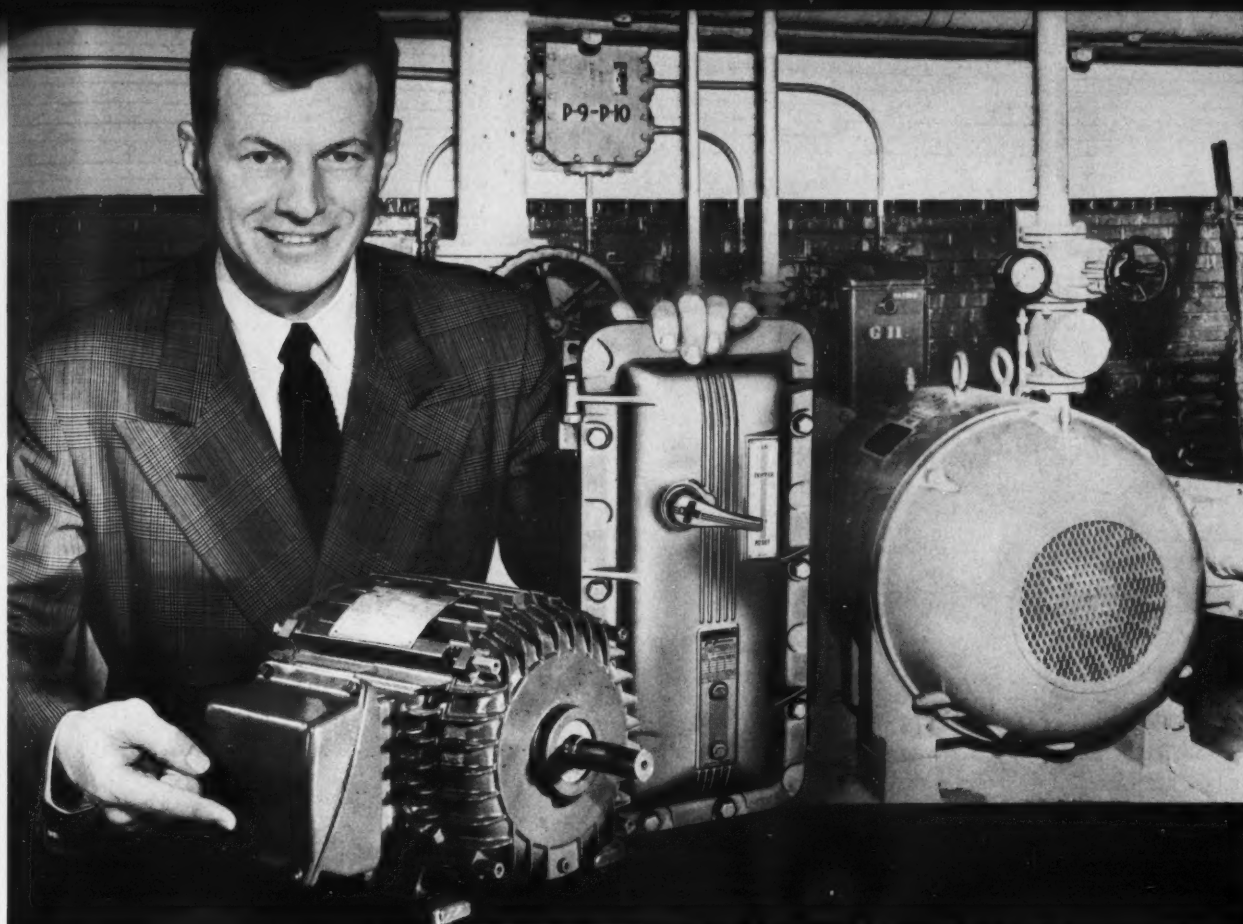
Usually, a running log is kept where a specific quality is plotted against lots of product in chronological order. (Such a chart — on melting points — is shown below.) Trends can be spotted easily with

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## What you can do to attain round-the-clock production continuity

### HERE ARE 4 WAYS WESTINGHOUSE POWER PARTNERS CAN HELP

Motion is basic to all chemical processing. Materials must be moved, mashed, blown, crushed and moved again. Keeping that motion uninterrupted is a mountainous task, but one that can be simplified by using time-proved Life-Line® motors, gearmotors and controls. Here's how:

**BETTER PROTECTION**—Both inside and out, Life-Line motors, gearmotors and controls are built to take the beating inherent in the chemical industry. They are designed to cope with corrosion, shock and other mechanical hazards, dust, dirt, and outdoor exposure.

**FEWER OUTAGES**—Records show that Life-Line motors and gearmotors have an average outage rate of one-half that of conventional motors. Balanced design and advanced materials make the difference.

**LESS MAINTENANCE**—Less production time is lost maintaining Life-Line motors—they require no on-the-job greasing. Less production time is lost maintaining Life-Line controls.

**THE MOST COMPLETE LINE**—You don't get divided responsibility when you specify Life-Line. Westinghouse builds the most complete line of drives for the chemical industry . . . motors, controls, speed reducers and gearmotors. You can match the right motor, gearing and control to your specific need.

YOU CAN BE **SURE**...IF IT'S **Westinghouse**

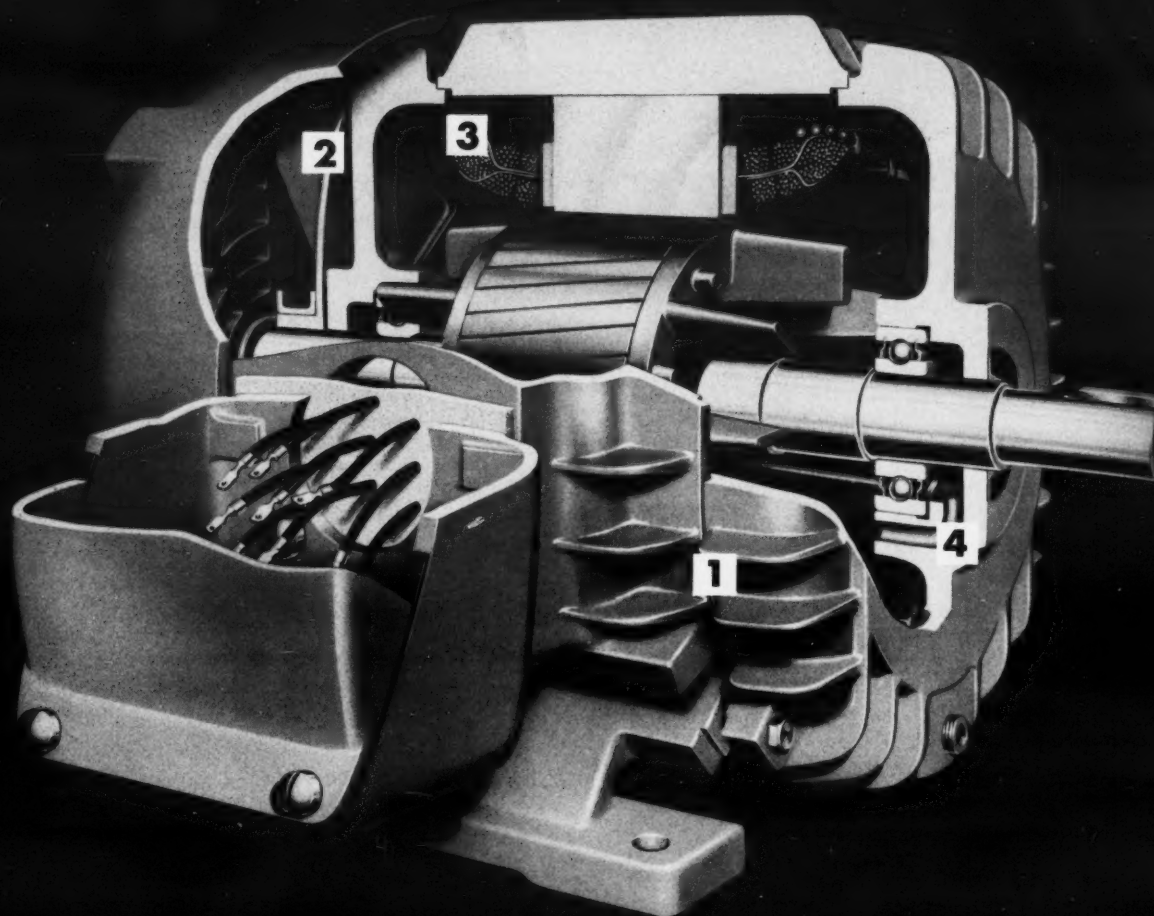


THE NEXT THREE PAGES DISCUSS OTHER REASONS WHY LIFE-LINE MOTORS  
AND CONTROLS CAN HELP YOUR PRODUCTION CONTINUITY.





# MINIMIZE CORROSION...



## 1. CORROSION-PROOF CAST IRON FRAME AND BRACKETS

The housing is the one element that is responsible for protection of the internal parts of the motor. The Life-Line housing provides three-way protection: (1) only fine-grained castings are used, (2) all wall sections are uniformly thick, and (3) all fits are accurate and sealed.

## 2. CORROSION-PROOF FAN

The external cooling fan is a critical member of a totally-enclosed, fan-cooled motor. By producing a sucking action, it draws large quantities of surrounding foreign material to it. This design dictates the use of thin-walled blades that are easy prey to corrosion. Life-Line solved the problem by making the fan of a rugged, chemically inert material—molded glass plastic.

## 3. FORTIFIED INSULATION SYSTEMS

Contaminating vapors can penetrate any totally-enclosed motor and attack the electrical components if they are not properly protected. Life-Line's insulation system makes sure this cannot happen. Only with Life-Line do you get the protection of Bandar conductor insulation combined with Bandite silicone-reinforced stator insulation... a protective combination unsurpassed by any other motor.

## 4. AIR BYPASS

Every totally-enclosed motor "breathes" as the internal air expands and contracts with change in temperature. Ordinary motors "breathe" along the shaft and through the bearings. Contaminated air enters the bearings and becomes a source of bearing failure. Life-Line eliminates this trouble source by providing an air bypass around the bearings.

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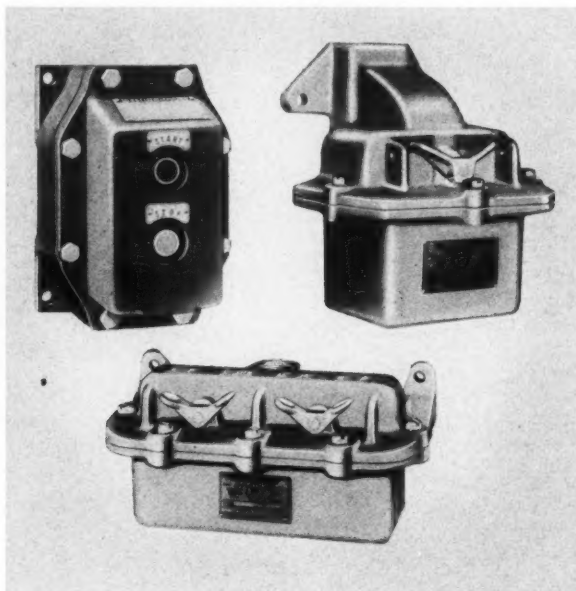
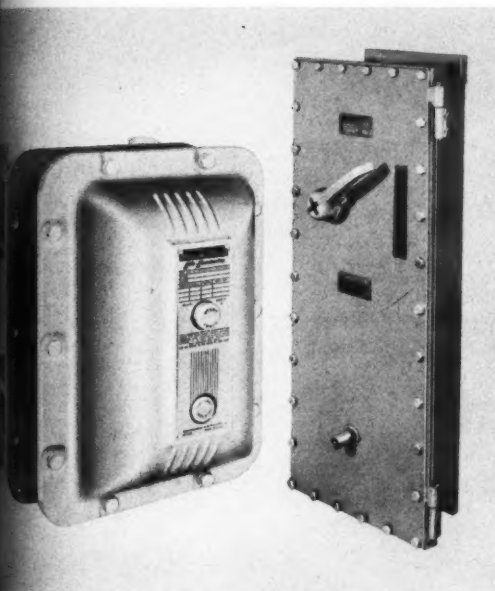
All types  
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starters®  
plate or  
available  
cations.

## with Life-Line motors, gearmotors and controls

Corrosive solids, liquids, atmospheres, mild chemicals and severe chemicals—all must be reckoned with when applying motors, gearmotors and controls. Westinghouse equipment has been designed to give you maximum protection against the ravages of corrosion.

Life-Line motors, gearmotors and controls are also protected against physical abuse—bumps from

passing vehicles—jars from falling objects—shocks from heavy machinery operation. Life-Line "A" motors combine the strength of fine-grained cast iron with the reinforcing of heavy ribs. False operation of contacts under vibration or accidental impact is no problem with the Westinghouse Life-Line Starter . . . the inverted knife-edge bearing is spring loaded and does not depend on gravity for operation.



All types of Westinghouse Controls are available in enclosures especially suited for use in the chemical industry. Line starters® and combination Linestarters are available in heavy plate or cast-iron enclosures. Oil-immersed starters are available for corrosive and explosive atmosphere applications.

A large variety of Westinghouse Pushbuttons and pilot controls are available with cast-iron enclosures for use in severe operating conditions. Many chemical companies have found it desirable to locate their starters outside the corrosive areas and operate them remotely by these push-buttons.

YOU CAN BE SURE...IF IT'S  
**Westinghouse**





# Turn to AV Packaged Drives to keep adjustable speed equipment running at peak capacity

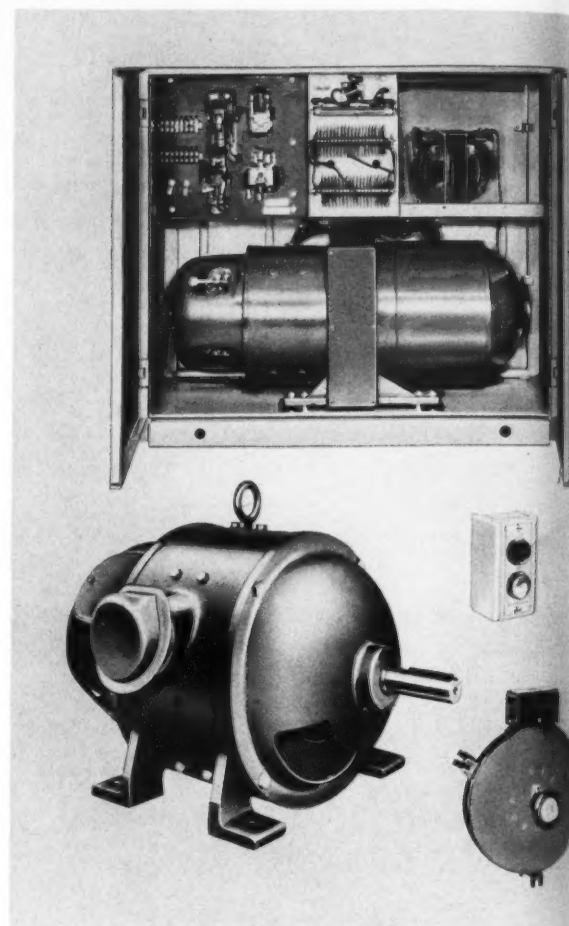
The Westinghouse Life-Line AV Drive is a complete, adjustable-voltage drive system—a factory-engineered package. Flexible in application, this packaged drive serves the chemical industry wherever exacting speed control from an a-c power line is required. The Life-Line AV Drive provides: adjustable speed—precise speed regulation—smooth acceleration and deceleration.

Got a tough drive problem that is giving you trouble? Call on the services of a Westinghouse Consulting and Application Engineer. His specialized knowledge qualifies him to analyze fully your specific drive requirements and to recommend the proper equipment.

## Here's the backup maintenance and repair service you get when you specify Westinghouse

**Westinghouse Maintenance Service** is a national organization established to meet all your needs for the repair or overhaul of electrical apparatus. **31 Warehouses**, located in prime industrial centers across the country, carry a well-rounded supply of Westinghouse Genuine Renewal Parts. **38 Specially Equipped Apparatus Repair Shops** are set up to repair every conceivable type of electrical apparatus. **46 Field Service Offices** are ready to make inspections, and on-the-spot repairs for equipment that cannot be moved easily. Ask your Westinghouse Representative how you can take advantage of these facilities.

MP-3037



YOU CAN BE **SURE**...IF IT'S **Westinghouse**



Gentlemen:

Please send me the following Westinghouse literature:

Name .....

Firm .....

Address .....

City ..... State .....

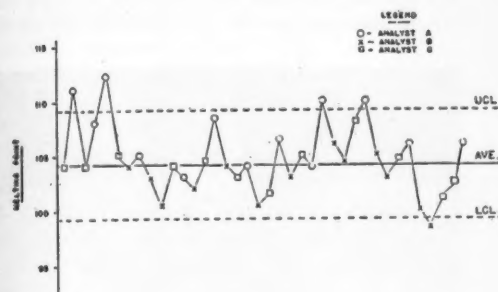
### SEND FOR THIS HELPFUL LITERATURE

- |   |   |
|---|---|
| <input type="checkbox"/> New Life-Line "A" Motor<br>..... <b>B-6154</b>                                 | <input type="checkbox"/> Westinghouse Motors and<br>Controls in the Chemical<br>Processing Industries...<br>..... <b>B-4791</b> |
| <input type="checkbox"/> Life-Line AV Drives<br>..... <b>B-5808</b>                                     | <input type="checkbox"/> Preventive Maintenance...<br>..... <b>B-5477</b>   |
| <input type="checkbox"/> Automatic Operation Start<br>with Westinghouse Con-<br>trol..... <b>B-5882</b> | <input type="checkbox"/> Life-Line Gearmotors...<br>..... <b>B-5645</b>   |
| <input type="checkbox"/> Complete Industrial Con-<br>trol and Services... <b>B-6051</b>                 |   |

this arrangement. Effects of wearing of equipment, or differences from lot-to-lot of raw material are easily seen. Both trends and "breaks" of the curve have obvious significance.

Furthermore, the limits shown (upper and lower control limits) are reliable gages as to whether observed variations are due to chance or whether they are assignable to causes in the process.

An interesting point comes to light in the control chart here: analyst A is obtaining melting point readings consistently higher than the other analysts.



Thus, under these circumstances, a control chart can detect errors in the sampling-testing operations as well as in process operations.

As a matter of fact, it is possible to use SQC with small samples and obtain better results than can be obtained by the expedient method of 100% sampling. In one instance a small sample was tested and a prediction of 15% rejects was made. A 100% inspection of the lot produced 5% rejects. Experts were able to find the missing 10% when they inspected. Operator fatigue in the tedious inspection work can be the cause of situations like this.

(From information contained in a paper delivered by Dr. Lawrence M. Debing of Monsanto Chemical Co., Dept. CP, 1700 S. 2nd St., St. Louis 4, Mo.)

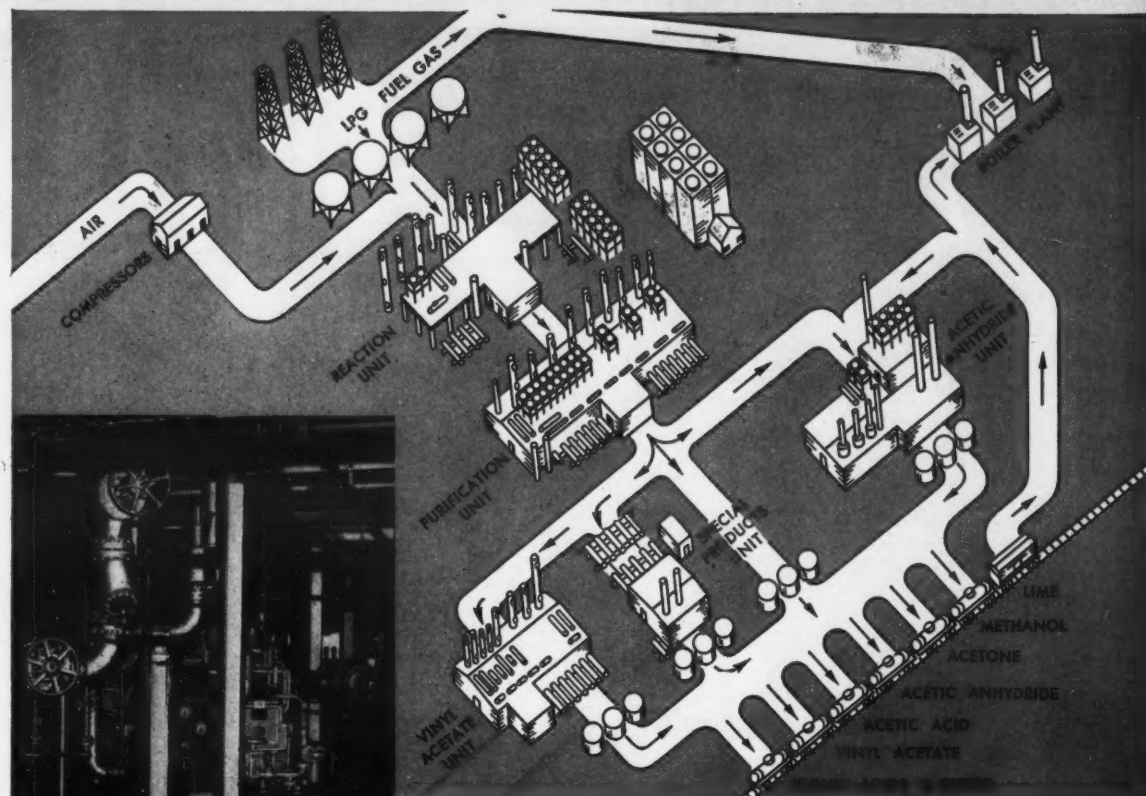
(Dr. Debing's paper, "Statistical Quality Control in the Plastics Industry," was delivered at the Ninth Meeting of the New England Section of The Society of the Plastics Industry, Dept. CP, 67 W. 44th St., New York 36, N.Y.)

#### Illustrates steam joint installation

Information regarding correct installation of rotary steam joints, which serve as pipe union between revolving steam drums or tilting kettles and stationary pipe line is given on handy chart.

Bul 5080 is available from Seamlex Co., Inc. Dept. CP, 4123 24th St., Long Island City, N. Y. Specify CP 8218 on handy form which is located between pages 2 and 3.

For more information on product at left, specify CP 8219 . . . see information request blank between pages 2 and 3.



**PROCESSING SEQUENCE OF NEW CELANESE PLANT** at Pampa, Texas. Starting point of Celanese's new process is in the compressor house, where four Worthington high-speed turbines drive a battery of multi-stage centrifugal compressors. Insert shows one of the four Worthington high-speed turbines used at Celanese.

## Four high-speed Worthington turbines drive compressors in new Celanese plant

In May, 1953, Celanese Corporation of America opened their new petro-chemical plant near Pampa, Texas, in the heart of the Panhandle.

By employing a new air-oxidation process, the Pampa plant will produce 1,800,000 lbs. of glacial acetic acid weekly, with 95% normal butane used as a charging stock.

Celanese selected four high-speed Worthington steam turbines to drive the centrifugal compressors used to compress air at the start of the oxidation process. The speeds of the turbines were determined by the nature of the process itself: two of the units are rated 3070 hp at 10,000 rpm, and two are rated 5000 hp at 7500 rpm. The control problem created by this arrangement was solved by using

Worthington Woodward governors with built-in air motors. The four turbine-compressor units are synchronized automatically by instrumentation in the control room.

There's a good reason why Celanese — and so many other leading industrial names — choose Worthington high-speed turbines for compressor and blower drives. They know that Worthington's long experience in compressor-drive engineering assures them of getting exactly the right type and size drive for their needs.

Find out how Worthington can help with your drive problems. Contact your nearest Worthington district office or write for Bulletin 1966 to Worthington Corporation, Steam Turbine Division, Wellsville, N.Y.

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## WORTHINGTON



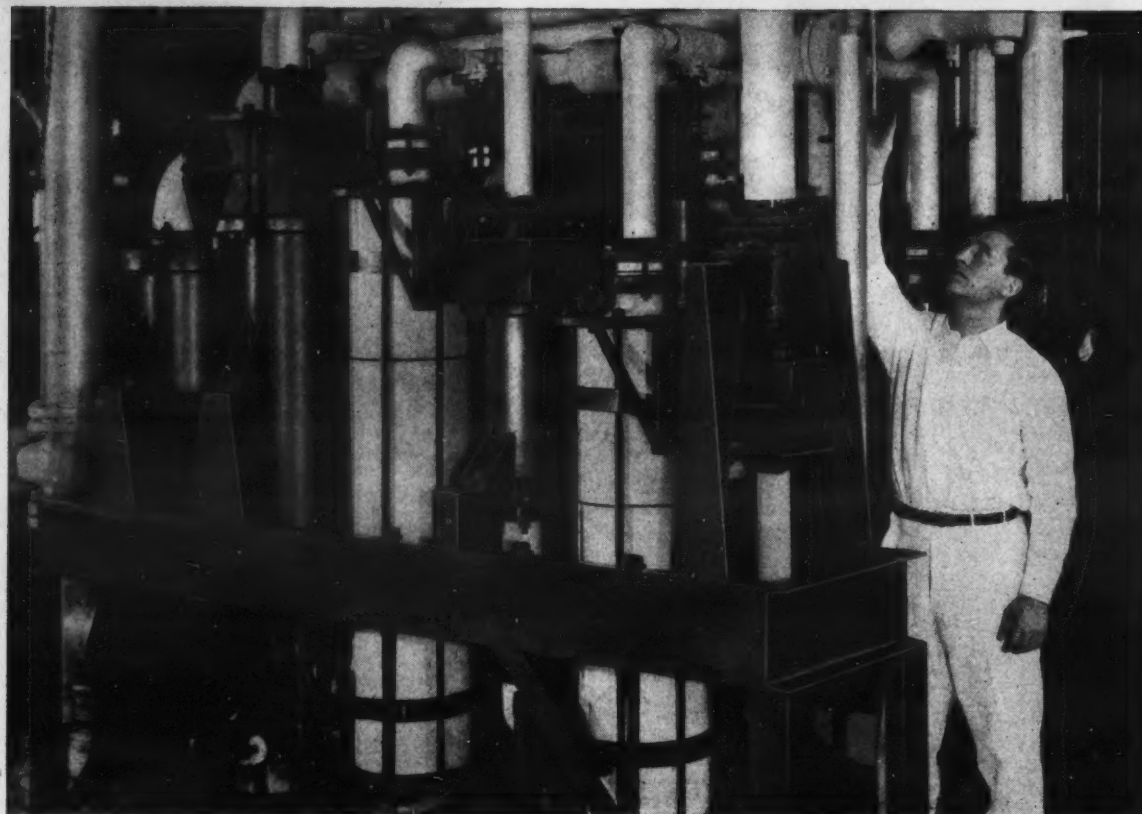
### STEAM TURBINES

Single and Multi-Stage Turbines • Turbine-Generators • Deaerators • Boiler Feed Pumps • Surface Condensers

**A GREAT TEAM IN STEAM**

When inquiring check CP 8220 on handy form, pgs. 2-3





**FOUR-STAGE WORTHINGTON STEAM JET EJECTORS** of impervious graphite, with two porcelain barometric intercondensers at Pfizer plant. Ejectors are used to maintain vacuum in vitamin A synthesis.

## Worthington steam jet ejectors maintain vacuum under corrosive vapor attack at Pfizer

Exhibit A in the case for Worthington steam jet ejectors is this installation at Chas. Pfizer & Co. plant in Groton, Conn.

Two years ago these Worthington units replaced rotary vacuum pumps assigned to maintaining a steady vacuum for a distillation process in the manufacture of synthetic vitamin A. This constant vacuum of 1 mm (equivalent to 1.04 mm of mercury) must be held for two days, the period of processing. When corrosive vapors showed up unexpectedly in the process, the rotary vacuum pumps just couldn't take it. These vapors have no effect, however, on the Worthington ejectors which

are designed specifically to function reliably under the toughest kind of corrosive conditions.

Maybe your product is corrosive; maybe it isn't. But if you need a vacuum from atmosphere to 50 microns absolute, take a long look at Worthington's comprehensive line of steam jet ejectors which use regular plant steam. They're low in first cost, and their operating and maintenance expenses are practically non-existent — no moving parts. You can specify them in stainless, bronze, porcelain, impervious graphite, Worthite, cast iron or steel. Write Worthington Corporation, Steam Power Division, Ejector Section X.3.2, Harrison, New Jersey.

X.3.2

# WORTHINGTON



Steam Jet Ejectors • Gas Compressors • Chemical Pumps • Industrial Mixers • Refrigeration Equipment

When inquiring check CP 8221 on handy form, pgs. 2-3

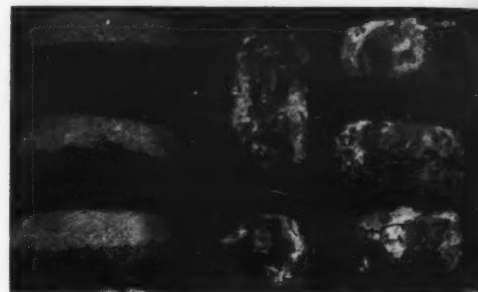
### IDEAS

**Corrosive water has no effect on coated cooling sections after two years . . .**

find plastic base aluminum compound makes tight, flexible, adherent coating

Tests made by National Radiator Company, extending over a period of more than two years, indicate that cooling and condensing sections covered with a protective coating will hold up very well under extremely corrosive conditions.

The coating, Kolmetal, is a mixture of finely pulverized aluminum powder in a special plastic vehicle.



Highly corrosive cooling water did not attack coated cooling sections (left) after two years of service

Metallic particles comprise about 85% (by volume) of the mixture. Plastic base seals metal particles to make tightly bonded, flexible, adherent coating.

Coated sections were tested in contaminated salt water having a pH of 4-5. Uncoated cooling sections required extensive cleaning at end of two years to restore efficiency. Sections were covered with heavy oxide and organic slime deposits. Identical sections with coatings were clean and free of corrosion.

Coatings were applied as soon as castings were removed from molds. Extra cost of coated sections is said to be less than cost of single cleaning operation for uncoated sections.

Cooling sections in service can be given protective coating providing they are thoroughly sand blasted to remove all traces of oxidation, scale or other surface contamination which would weaken adhesion. Coating, properly applied, can be polished, ground, drilled, or bent to 45° angle without chipping, peeling or cracking. Coated sections can be handled in same manner as untreated sections for crating, shipping, and erection.

(Kolmetal coating is development of Emjay Maintenance Engineers, Dept. CP, 327 Union Avenue, Rutherford, N. J. . . . or for more information check CP 8222 on handy form, pages 2 and 3.)

For a quick method of determining

**BOILER HEAT LOSS**

See page 194 of this issue

**Sulfuric solution pumped through plastic pipe . . .**

rinse water from steel pickling operation travels 2400 feet

Rinse water contaminated with sulfuric acid is discharged at about 120°F through plastic pipe at the Alan Wood Steel Company, Conshohocken, Pa. The corrosive water comes from a 30-inch continuous steel pickler and is disposed of in a prepared waste bed.

Pickling operation utilizes 15% acid solution at approximately 200°F. After pickling, steel is removed to rinse tanks where water at 180°F is sprayed over steel to remove acid. Water from this operation drains into a trap and is used to scrub acid mist from discharge fumes.

To dispose of the contaminated water, 20-ft lengths of Tenite butyrate plastic pipe, 3-inch diam (extruded by Busada Manufacturing Corp., Maspeth, N. Y.), were joined to make a pipeline 2400 ft long. Pipeline joints were made with slip-sleeve couplings and solvent cement. Line is buried four feet underground. Water is pumped at 165-ft head pressure through line.

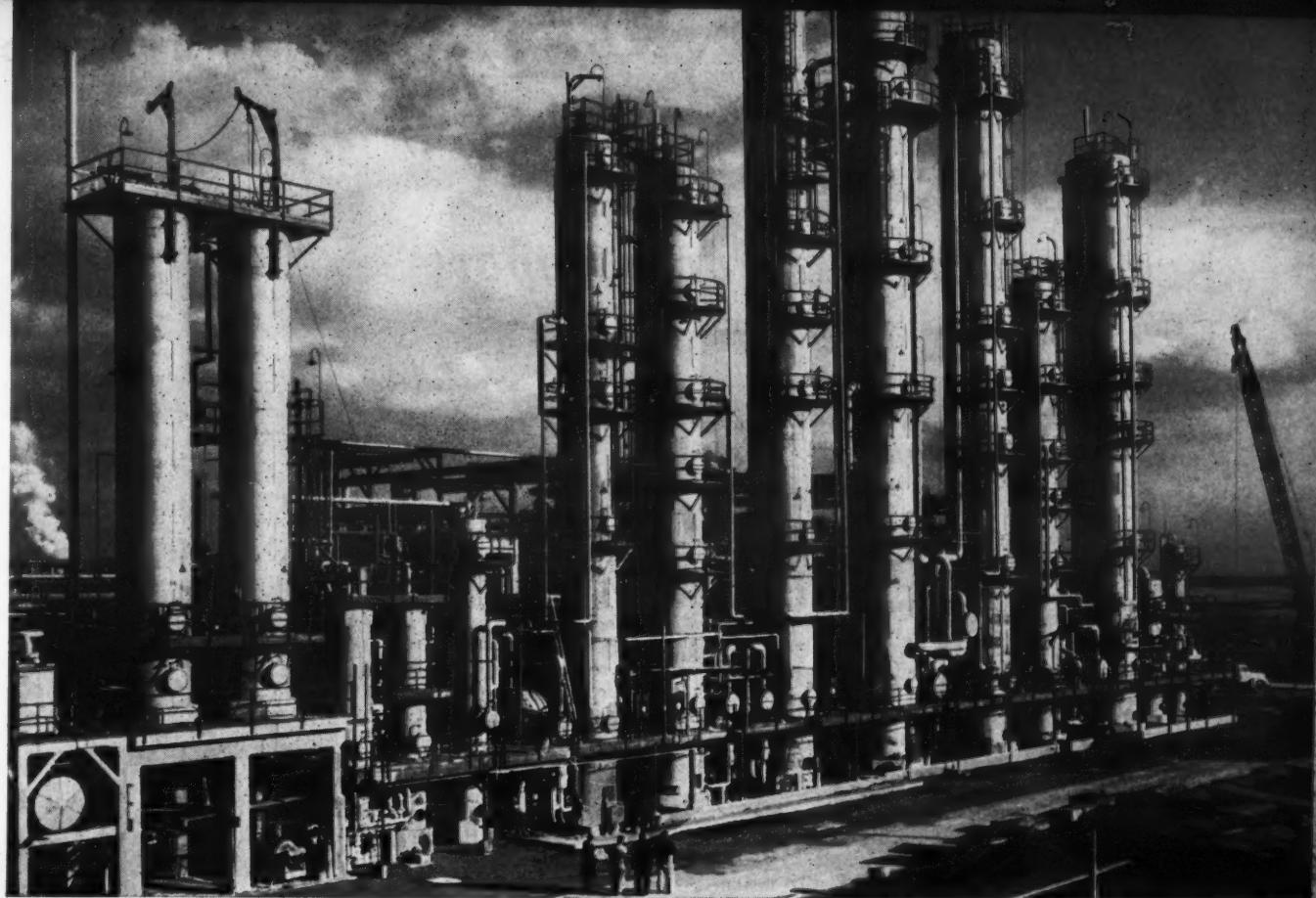
(Tenite butyrate plastic is a product of Eastman Chemical Products, Inc., Dept. CP, Kingsport, Tenn. . . check CP 8223 on handy form, pages 2 and 3.)

**Bibliography report covers 41 fields**

Bibliographies of available technical reports covering 41 fields, including pharmaceuticals, agricultural chemicals, plastics, chemical engineering, paper, textiles, metals, mineral products, and fuels, are listed in 30-page monthly government publication.

To obtain annual subscription to "Bibliography of Technical Reports", remit \$6.00 direct to US Department of Commerce, Office of Technical Services, Washington 25, D. C.

For more information on product at right, specify CP 8224 . . . see information request blank between pages 2 - 3.



# SUN OIL'S PETROCHEMICAL PLANT

now making high-purity aromatics

NITRATION	NITRATION	10 DEGREE
<b>BENZENE</b>	<b>TOLUENE</b>	<b>XYLENE</b>

The new \$15 million Sun Oil Company petrochemical plant in Marcus Hook, Pa., can now supply benzene, toluene and xylene that meet a new high standard of purity. It is the largest and most modern plant on the East Coast producing these aromatics from petroleum.

Precision instrumentation, combined with the most modern available facilities, provides constant control of every step in the refining process. Only

selected feed stocks are used. The result is month-in, month-out sameness—even with high volume throughput—plus new versatility and efficiency.

Other petrochemicals produced by Sun Oil Company include propylene trimer and tetramer, sulfonates, and a new type of high-molecular-weight naphthenic acid that is practically free of oil. For a technical bulletin describing any of these Sun petrochemicals, write Department CP-5.

**INDUSTRIAL PRODUCTS DEPARTMENT**

**SUN OIL COMPANY**

PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL

Refiners of famous Blue Sunoco Gasoline and Dynalube Motor Oils





Armour assures safety in

# handling hazardous vapors

with explosion-proof enclosures

**Have provided protection from flammable gases for five years at company's fatty acid plant**

**Problem:** When Armour and Company's fatty acid plant at McCook, Ill., was being constructed five years ago, problem was presented of handling acetone and flammable gases with a minimum of hazard. Although adequate ventilation and proper safety rules were a primary consideration, explosion-proof electrical equipment was also a requirement.

**Solution:** Company installed Class I, Group D explosion-proof electrical equipment, typical examples of which are shown in accompanying photographs, throughout the plant area.

Enclosures, known as Condulets, are constructed so they have sufficient strength and close-fitting joints to withstand and confine repeated explosions, without igniting the surround-

ing atmosphere. Housings are made of Feraloy, an alloy having desirable characteristics of both cast steel and gray iron. Durable finish is provided by a heavy zinc plating, covered by a coating of vinyl resin base aluminum lacquer. Enclosures are thoroughly tested and Underwriters' Laboratories approved.

**Results:** Plant has operated safely for five years handling the hazardous gases. Enclosures are still in excellent condition, many of them still having the same appearance as when they were installed.

(Explosion-proof Condulets are manufactured by Crouse-Hinds Co., Dept. CP, Syracuse 1, N. Y. . . or for more information check CP 8225 on handy form, pages 2 and 3.)

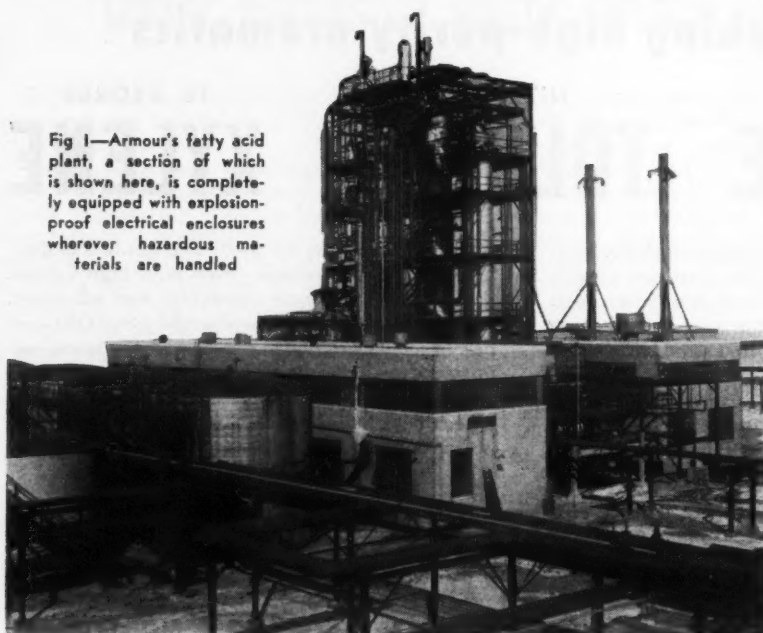


Fig 1—Armour's fatty acid plant, a section of which is shown here, is completely equipped with explosion-proof electrical enclosures wherever hazardous materials are handled

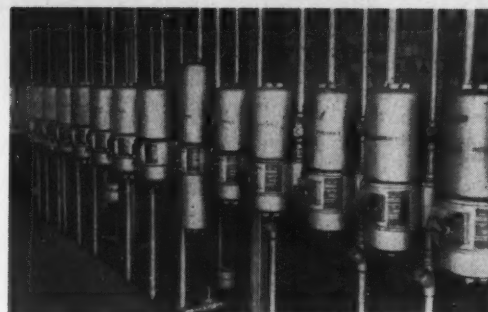


Fig 2—Explosion-proof starting switches in crystallizing building reduce hazard from handling of acetone



Fig 3 & 4—Front and rear views of explosion-proof instrument panel in crystallizing building. Note flush design of lights in ceiling

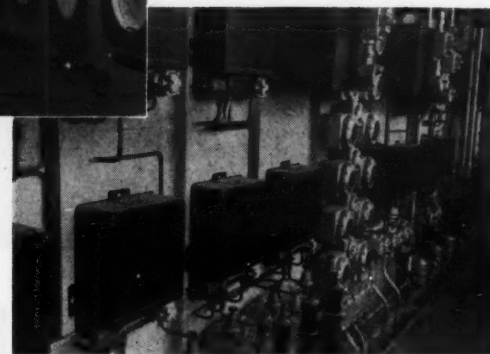


Fig 5—Explosion-proof elbow and flexible coupling in compressor room



Fig 6—Explosion-proof fluorescent and incandescent lighting fixtures over control test workbench

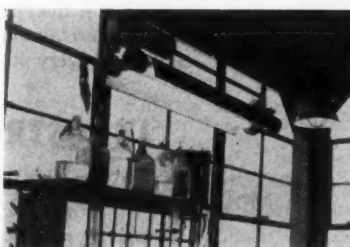


Fig 7—Ventilating fan in building where fatty acids and nitriles are treated, also utilizes explosion-proof enclosures

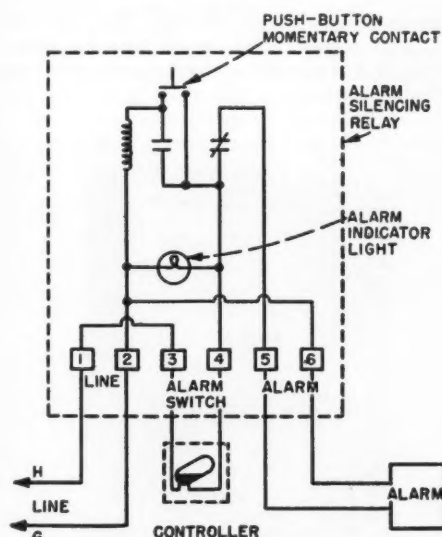
## Turns alarm system on if accidentally left off

**Silencer keeps red pilot light burning while correction is being made and re-sets alarm automatically afterwards**

**Uses:** For turning off audible control alarms yet retaining a visible indication that a limit has been reached or exceeded. Also assures that control system returns to operation after correction has been made.

**Features:** Relay can be used in conjunction with temperature controllers, pressure controllers, flame failure safeguard systems or in any application where actuation of an alarm is involved.

**Description:** Unit eliminates chance that worker might leave audible alarm inoperative after repairs are made on equipment it protects. Silencer de-



Although alarm is silenced, indicator light will remain on until controller contact is broken. When this happens, alarm circuit is reset

energizes alarm and retains visible indication that stays on until system is operating correctly. The silencer then resets alarm automatically and red light goes out.

Voltage and frequency are 115 or 230 volts, 50 or 60 cycles. Electrical ratings are 5 amp at 115 volts, 2½ amp at 230 volts AC. Dimensions are 4¼ x 5¼ x 3".

(Model 1D002A1 Silencer is available from Minneapolis-Honeywell Regulator Co., Industrial Div., Department CP, Wayne and Windrim Ave., Philadelphia 44, Pennsylvania . . . or for more information concerning manufacturer's product, reader may simply check CP 8226 on the convenient Reader Service slip which is located between pages two and three.)



## As never before...

*Today we are all aware of the disastrous and far-reaching effects of a major industrial fire. Owners . . . management . . . employees . . . customers . . . almost every one suffers, in one way or another, when a serious fire strikes.*

Could it happen to your plant? Now is the time to take a long, close look at your plant's fire protection measures. Remember, the local fire protection ordinances normally only set minimum standards. Compliance with these ordinances is no guarantee of fully adequate firesafety.

One way to be absolutely sure of the efficiency of your plant's fire protection facilities is to call in an expert C-O-

TWO Fire Protection Engineer. He is ready and willing to help you with any or all industrial fire hazard problems.

There is a personal sense of responsibility inherent with C-O-TWO Fire Protection Engineers that assures you of fully adequate firesafety . . . a definite plus in your behalf. Whether it's fire detecting or fire extinguishing . . . portables or built-in systems . . . C-O-TWO means top quality backed by experienced engineering that results in operating superiority for you at all times.

### WHEN BUSINESS STOPS . . . INCOME STOPS!

Don't take chances with your investment. Secure the benefits of highly efficient fire protection engineering today . . . our extensive experience over the years is at your disposal without obligation. Get the facts now!



MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeeze-Grip Carbon Dioxide Type Fire Extinguishers  
Dry Chemical Type Fire Extinguishers  
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### C-O-TWO FIRE EQUIPMENT COMPANY NEWARK 1 • NEW JERSEY

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Sales and Service in the Principal Cities of United States and Canada

AFFILIATED WITH PYRENE MANUFACTURING COMPANY

When inquiring check CP 8227 on handy form, pgs. 2-3



**ONLY 3.2%**  
**OF TOTAL PIPING COSTS**  
**FOR LABOR!**

### ...SPEEDLINE FITTINGS MAKE THE DIFFERENCE AT INDIANA FERTILIZER PLANT

Cost breakdown on this recently completed stainless steel piping installation reveals 96.8% of the total expenditure was for materials . . . only 3.2% for labor!

Impossible? Not with a SPEEDLINE system!

These are the actual figures reported by H. E. Little, Plant Superintendent at E. Rauh and Sons Fertilizer Company, Indianapolis, where SPEEDLINE fittings were used on a new phosphoric acid line. Aligning connectors and formed fittings with exclusive SPEEDLINE tangential simplified installation . . . cut labor time and costs to a bare minimum.

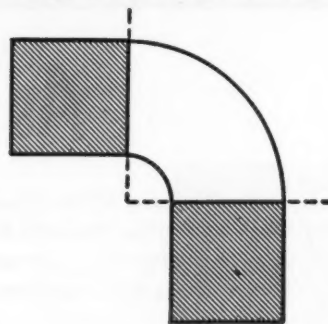
E. Rauh and Sons saved on material costs, too. Plant Engineer was able to use low cost schedule 5 pipe for the entire line—without loss of effective wall for pressure and flow requirements. Intergranular corrosion problems were solved by correct analysis, rather than needless additional pipe wall.

The results? Savings of nearly 50% in material costs as compared to using schedule 40 pipe with conventional screwed fittings—plus greater flow and increased capacity!

Light-wall pipe with SPEEDLINE corrosion-resistant fittings can also cut piping costs at your plant.

Designed especially for economical schedules 5 and 10 pipe SPEEDLINE fittings, speed installation, provide easier aligning and greater flexibility of design to reduce your costs right down the line.

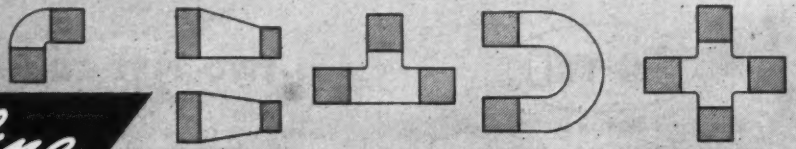
The drawing shows a SPEEDLINE 90° Elbow. The dotted lines show the termination points of conventional fittings. The additional straight section of SPEEDLINE



fittings permits attaching of unions or flanges (as in photo above) without fouling, reduces the number of welds required, and eliminates troublesome curved or angle joints.

Speedline distributors are located in principal cities from coast to coast

Write for  
a copy of  
"Speedline  
Fittings"...with-  
out obligation.



**Speedline**

Corrosion-Resistant FITTINGS—the newest thing in pipeline economy

Manufactured by **HORACE T. POTTS CO.** • 502 E. Erie Avenue • Philadelphia 34, Penna.

When inquiring check CP 8228 on handy form, pgs. 2-3

## SAFETY

### Handy chart selects gloves for corrosive chemicals

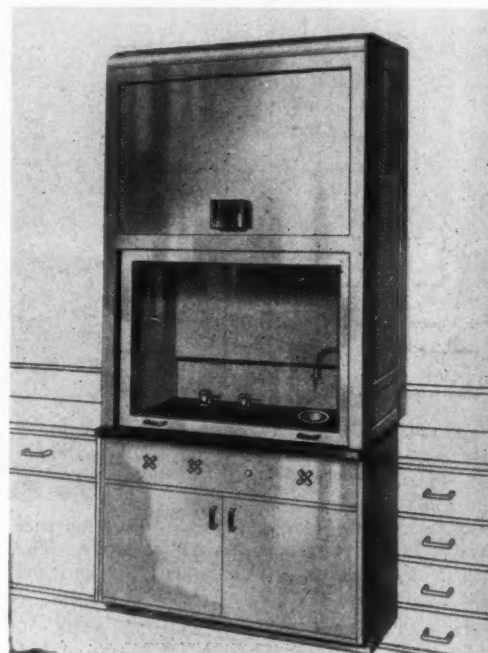
Compact, pocket-size slide chart shows correct gloves for wear when handling various acids, oils, solvents, abrasives, and chemicals. Chart measures 8½ x 3" and rates gloves according to performance where resistance factor is negligible between gloves or where gloves are subject to more than one destructible element.

Glove Selector is issued by Surety Rubber Co., Dept. CP, 128 Hall Ave., Carrollton, Ohio. Specify CP 8229, pages 2 and 3.

### Head, shoulders protected by extended control of fume hood . . .

allows laboratorian to control experiments without opening safety-glass window

By means of controls on the front panel of fume hood, any normal hood service can be started, stopped, its rate adjusted without opening protecting safety-glass window.



Window can be kept shut while making adjustments

Top used in fume hood is resistant to localized heating and is treated with a chemically resistant finish. Deck-mounting of services at rear of 48 x 31" top gives additional working space ordinarily taken up by reagent shelf.

(Extended-Control Fume Hood is a product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . check CP 8230, pages 2 and 3.)

## SAFETY

### **Menthol-lanolin gives hand cream special skin-oil qualities . . .**

restores oils depleted by excess use of waterless and naphtha solvent cleaners

Prophylactic hand cream for industrial use combats skin-drying and cracking effect of kerosene-base waterless hand cleaners, and strong detergent hand cleaners.

Preparation contains 15% hydrous lanolin and USP menthol in hydrophilic cream base. It helps restore depleted oils in situation where the skin is chapped and irritated.

("Donavo" is a product of The Chase Chemical Co., Dept. CP, 1374 E 170th St., Cleveland 10, Ohio . . . or for more information check CP 8231 on handy form, pages 2 and 3.)

### **Disposable paper work cap is resistant to acids, alkalis**

Developed by Du Pont's safety engineers for use in one of company's large chemical plants, paper work cap is made of heavy kraft paper which has been treated with neoprene synthetic rubber. Cap is water repellant and comes pre-treated with a flame retardant.

In appearance, paper caps follow conventional work cap lines and are sewn together in much the same manner as cloth caps. There is leatherette sweat band around inside, and reinforced visor with cloth piping around the edge. Paper is crepe-textured for greater tear resistance.



Crepe-textured for greater tear resistance

(Neo-Caps are available from Record Industrial Co., Dept. CP, 3301 Arch St., Philadelphia 4, Pa. . . . or for more information concerning manufacturer's product, reader may simply check CP 8232 on handy form, pages 2 and 3.)

## consider but **2** basic factors . . .

. . . when you think of fire protection, the selection of the very best of mechanical devices and—the engineering of these devices into an automatic system which will provide the maximum protection against your specific hazard.

Both are important. The finest of both are to be had at Blaw-Knox.

Blaw-Knox Fog Systems, thermostatically controlled, instantly blanket all protected equipment with millions of cooling drops of water which extinguish the fire and quickly absorb heat. They sound alarms, confine damage and protect nearby equipment.

Carefully engineered into a fire protection system designed to guard against your specific hazard, Blaw-Knox Fog Nozzles provide the most effective means of protection known.

Let a Blaw-Knox Fire Protection Engineer study your needs, submit a preliminary layout and cost estimate . . . absolutely without obligation.

You'll be interested in the new Blaw-Knox booklet, "FIRE CAN DESTROY YOUR BUSINESS." Write for it.

**BLAW-KNOX FIRE PROTECTION SYSTEMS CARRY APPROVALS OF ALL INSURANCE UNDERWRITERS.** *Deluge Systems • Wet Pipe Systems • Dry Pipe Systems • Water Spray and Fog Systems • Rate-of-Rise Sprinkler Systems • Foam and Carbon Dioxide Extinguisher Systems*

"Little Joey Sprinkler" always on the job



## **BLAW-KNOX COMPANY**

*Automatic Sprinkler Department / Pittsburgh 33, Pennsylvania*

When inquiring check CP 8233 on handy form, pgs. 2-3



FEED

# CONTINUOUS SEPARATION

OF  
LIQUIDS AND  
SUSPENDED SOLIDS



**PAY-OUT** is the accepted standard of worth for any piece of equipment. How long will it take for the equipment to pay for itself out of labor-savings, increased output, improved product, and savings in space?

**HIGHER PRODUCTION CAPACITY** of Merco Separators will match your process demands. They replace tanks, filters, settling tables, and batch-type centrifuges, resulting in an immediate increase in production efficiency.

If your process requires continuous separation of liquids and suspended solids, we welcome an opportunity to prove to you that a Merco Separator has a *practical* pay-out period.

Your name on a letterhead, today, will bring you a "Process-Cost Analysis Sheet" by return mail. Just request Form C-45.

**MERCO CENTRIFUGAL CO.**

AFFILIATE OF THE MERRILL COMPANY ENGINEERS  
150 GREEN STREET • SAN FRANCISCO • CALIFORNIA

When inquiring check CP 8234 on handy form, pgs. 2-3

## SAFETY

### Safety, comfort provided by plastic helmet

Seamless plastic welding helmet is designed to provide safety without discomfort to wearer. Plastic shell is reported to be heat-re-



sistant, moisture-proof, and non-warping. Headgear fits contour of any head. Headsize adjustment is provided by ratchet device.

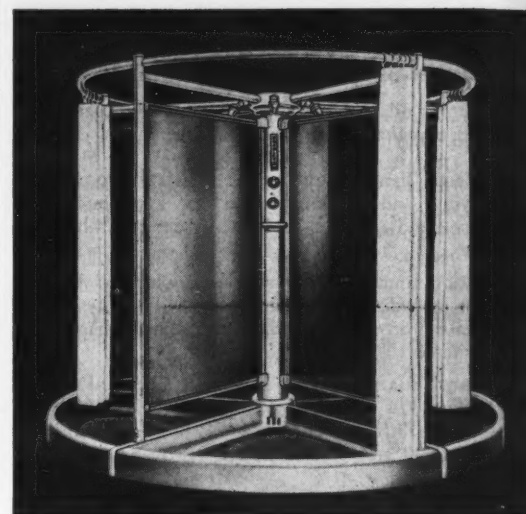
Helmet is available in durable black finish with or without flip-front. Respective weights of the two models are 29 and 25 ounces.

(Plastic Helmets are a product of the General Electric Co., Dept. CP, One River Rd., Schenectady 5, N. Y. . . or for more information check CP 8235 on the handy form between pages two and three.)

### Allows clear speech with gas mask on

Clear and resonant speech transmission is possible while wearing mask with use of speaking diaphragm facepiece. Diaphragm is multi-layer disc of special plastic film selected for high sound transmission qualities. No wires or batteries are required and free use of telephone is possible. It is approved by US Bureau of Mines.

(Speaking diaphragm is product of Mine Safety Appliances Co., Dept. CP, Thomas and Meade St., Pittsburgh 8, Pa. . . or for more information reader may simply check CP 8236 on handy Reader Service slip, located between pages 2 and 3.)



Complete 5-Stall Shower with receptors at bottom. Also made in wall-type 3-stall units.

## MORE PLANTS INSTALL BRADLEY

### MULTI-STALL SHOWERS

The sanitary features of Bradley Five-in-a-Group Showers and the savings in installation, piping and connections are realized by more and more plants. *One set* of cold and hot water, and one drain *replaces 5 sets* needed for 5 single-stall showers. Some recent Bradley installations include 4 Units at Ladish Co., Cudahy, Wis.; 3 at Evinrude Motors, Milwaukee, Wis.; 6 at International Paper Co.; 11 at North Seadrift, Texas chemical plant of Carbide & Carbon Co.; 6 at Marrero, La., plant of Celotex Corporation; 4 at Ford Motor Co., Canton, Ohio plant; 10 at Colombia, South America, National Steel Co. plant; 8 at Vancouver, Wash., plant of Aluminum Co. of America; and others, such as—Union Carbide, Standard Paint & Varnish, National Carbon (Mexico), Jones & Laughlin.

Column Showers (no partitions) provide lowest cost shower facilities. They serve five bathes simultaneously.

For helpful washroom Shower and Washfountain layout suggestions, write for Catalog 5204.

**BRADLEY WASHFOUNTAIN CO.**  
2231 W. Michigan Street, Milwaukee 1, Wisconsin

For complete data on Multi-Stall Showers and Washfountains, write for Catalog 5204

**BRADLEY**  
*multi-stall showers*

Distributed Through Plumbing Wholesalers



When inquiring check CP 8237 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## SAFETY

### Bul shows how to keep head and eyes out of danger

Illustrated 64-page catalog shows wide variety of head and eye protective equipment for industrial use. Designed primarily for men in charge of safety in foundries, factories, machine shops, mines, chemical plants, welding and grinding departments, book contains hundreds of illustrations of various types and sizes of safety equipment. Contents include safety glasses, goggles for welders and chippers, welding helmets, face shields, respirators, masks, hooks, aprons, sleeves, and grinder guards.

Bul 27 is issued on letterhead request to Chicago Eye Shield Co., Dept. CP, 2300 Warren Blvd., Chicago 12, Ill.

### Lighter, more maneuverable wheeled extinguisher operates faster . . .

charged weight is approximately 221 lb as compared to 266 lb for model it replaces

**Uses:** Extinguishing flammable liquid and electrical-type industrial fires too large to be handled by hand portable units.

**Features:** Charged weight is approximately 221 lb as compared with 266 lb for the model it replaces. A shorter cylinder, slightly larger in circumference, lowers the center of gravity and increases the ease of maneuverability for one-man operation. Squeeze lever-type valve on the horn operates instantly with hand pressure and may be closed just as quickly without loss of carbon dioxide by simply releasing the pressure on the operating lever.

**Description:** Series 4, Model 50-S Alfco Carbon Dioxide Engine is a wheeled unit which may be operated in either an upright or lowered position. Cylinder valve is a seat-type valve, hand wheel operated. The hand wheel is held off the valve stem until the locking pin is removed to allow the hand wheel to spring down and key itself to the stem. This design is stated to compensate for wear of the valve seat since the valve stem assembly can be tightly screwed down regardless of the locking pin hole location. Some specifications follow:

Size: nominal capacity in pounds	50
Floor space required, width in inches	18-1/16
Floor space required, depth in inches	28 3/4
Overall height, inches	51 3/4
Length of hose, feet	15
Diameter of wheels, inches	17 3/4
Weight without cylinder, pounds	54.5

The Model 50-S is equipped with the manufacturer's exclusive Alfco Anti-Statik Device which minimizes static electricity and insures safer operation in combating electrical blazes.

(Model 50-S extinguisher is available from American-LaFrance-Foamite Corp., Dept. CP, Elmira, N. Y. . . . or for more information reader may simply check CP 8238 on handy Reader Service slip which is located between pages 2 and 3.)



# TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS, General Offices and Works: P.O. Box 485, Chicago 90, Ill.  
Offices in all principal cities. Plants at: Carnegie, Pa.; Fontana, Calif.; Gary, Ind.; Hamilton, Ont., Canada

When inquiring check CP 8239 on handy form, pgs. 2-3





There are many vital business assets which are not insurable under any conditions. In fact, some of them are not replaceable at any cost. Safeguarding life, property, equipment, customers, public confidence and profits is worth many times the cost of ENGINEERED "Automatic" Sprinkler FIRE PROTECTION. It's well to remember that what's worth insuring is worth protecting!



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"The ABC of Fire Protection"

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North and South America

When inquiring check CP 8240 on handy form, pgs. 2-3

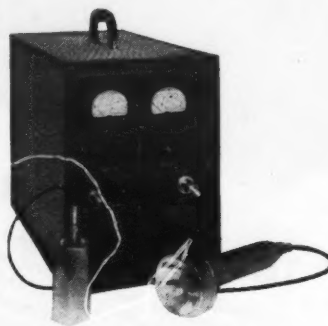
#### SAFETY

##### Checks vibration without dismantling machine

**Uses:** For vibration analysis and dynamic balancing of rotating parts.

**Features:** Balancing can be effected without removing parts from machines.

**Description:** Vibration pickup, equipped with rod-like probe, is held to mounting of the bearing and a stroboscopic light focused



on the mounting. Current generated in the pickup lights the stroboscopic lamp at frequency of the vibration. Balancing is achieved by adding weights.

(Vibration Analyzer is a product of International Research & Development Corp., Dept. CP, 168 E. Hosack St., Columbus 7, Ohio . . . or for more information check CP 8241 on handy form, pages 2 and 3.)

##### Find ammonia leaks in short order with tapers

Sulfur-impregnated tapers fit in pocket-size container. Ammonia leaks can be detected by lighting taper and holding it near equipment suspected of leaks. White cloud indicates point of ammonia leakage. Tapers may be extinguished and reused.

("Sulfstix" tapers are furnished free by Nitrogen Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N. Y. . . . or for more information concerning manufacturer's product, reader may simply check CP 8242 on handy form which is located between pages two and three.)

you'll be  
SURE-FOOTED  
as a mountain  
goat on...

**TRI-LOK®**  
*Serrated*  
**GRATING**



Tri-Lok provides you with the perfect open steel flooring for areas where grease, oil and other slippery conditions make walking dangerous.

By serrating both bearing and cross bars, a positive non-slip surface in every direction is assured . . . providing safe walking and eliminating an accident hazard.

Tri-Lok Serrated Grating contains all advantages of other Tri-Lok gratings PLUS the non-slip safety feature.

For more information write:

**DRAVO**  
CORPORATION  
PITTSBURGH 22, PENNA.

National Distributor for THE TRI-LOK COMPANY

When inquiring check CP 8243 on handy form, pgs. 2-3

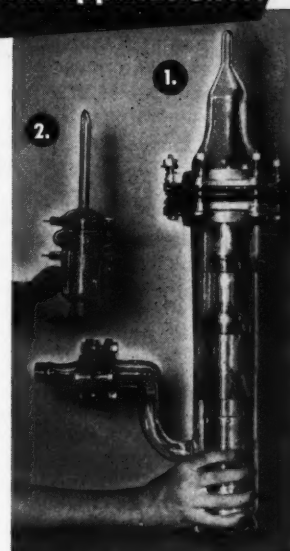
#### For High Vacuum Application...

##### 1. HV-1 DIFFUSION PUMP

- a high speed oil-diffusion type pump with an ultimate vacuum of  $4 \times 10^{-7}$  mm. Hg. designed for general service including nuclear science, research or material processing. Among its features are 1) Speeds up to 67 liters/second, 2) Clear glass pump barrel, 3) Simple maintenance, 4) No liquid cooling, charcoal traps or mechanical wear.

##### 2. 100-16 IONIZATION GAUGE

- a triode vacuum type ionization gauge that will measure pressure from approximately  $10^{-3}$  mm. of mercury to  $10^{-8}$  of mercury. Its Nonex glass can be sealed directly to exhaust systems employing Nonex or Kovar sealing glass, and to Pyrex by means of a graded seal. It has no internal insulators, and the en-



velope is designed to provide long leakage paths between the plate and other tube elements.

Complete Data Sent on Request. Write:

**EITEL-McCULLOUGH, INC.**  
SAN BRUNO • CALIFORNIA

Export Agents: Frazar & Hansen, 301 Clay St., S. F., Calif.

When inquiring check CP 8244 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## SAFETY

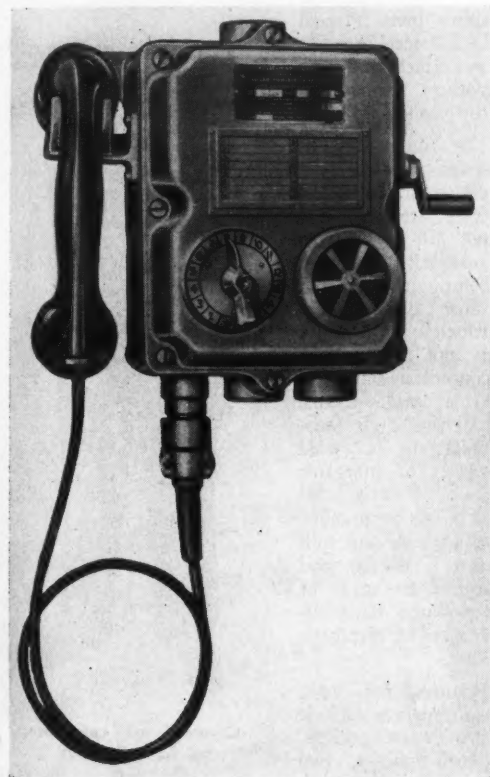
### Explosion-proof phone sheathed in two sections of Al housing . . .

no cradle switch is used, as a push button near center of handset serves this purpose

**Uses:** Phone for use in hazardous locations.

**Features:** Phone assembly is sheathed in two sections of aluminum housing that are made flame-tight by accurately machined joints and large screws.

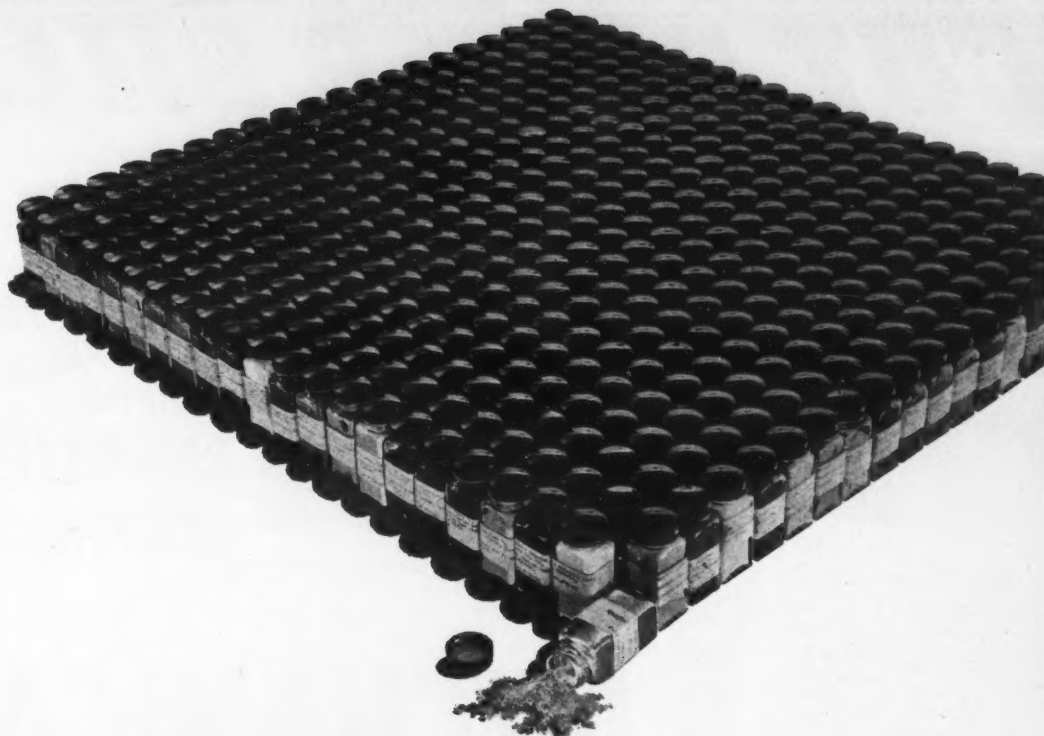
**Description:** Explosion-proof phone offered by this manufacturer is a sound-powered unit which can communicate with similar units within a range



of 30 miles. Rather than a bell, the phone is equipped with a magneto-powered howler that develops a loud, penetrating signal.

A fixed hook is attached to the left side to support the handset. No cradle switch is used, as a push button located near the center of the set serves this purpose. For both transmitting and receiving, the push button must be depressed and held in place by the operator.

(Explosion-proof phone is a product of Crouse-Hinds Company, Department CP, Syracuse 10, New York . . . or for more information concerning explosion-proof telephone, reader may simply check CP 8245 on the convenient Reader Service slip which is located between pages two and three.)



## Bottles of pure profit

These bottles contain samples of dust from literally hundreds of processing plants.

Naturally, because each bottle contained a different combination of dust, it presented a different dust collection problem . . . over 600 of them in the last 3 years!

From knowledge gained by planning, designing, and building dust collection equipment *tailored* to hundreds of different operating conditions . . . Buell has built an unmatched background of reliable and accurate knowledge and experience. From this knowledge, *gained the hard way*, Buell has developed three basic systems of industrial dust collection . . . made dozens of exclusive improvements in equipment.

Be sure you, too, have the latest facts. Send for your complimentary copy of our brochure — The Collection and Recovery of Industrial Dust. Write Buell Engineering Company, Dept. 11-E, 70 Pine Street, New York 5, New York.

# buell

MECHANICAL



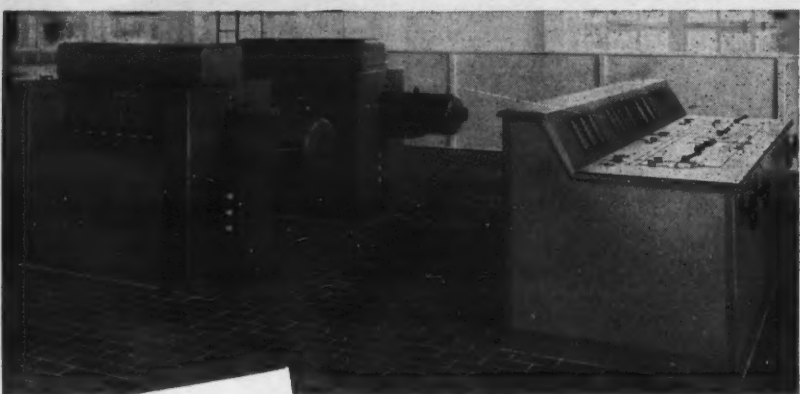
ELECTRICAL

20 Years of Engineered Efficiency in  
**DUST COLLECTION SYSTEMS**

When inquiring check CP 8246 on handy form, pgs. 2-3



# CUT POWER BILLS



These two Brown Boveri mechanical rectifiers were installed in 1950 in an aluminum plant. They were each rated 10,000 Amps D.C. at 140-250 Volts D.C. Due to accumulated experience and design refinements, similar units are now capable of carrying 20,000 Amps D.C. . . . resulting in appreciably lower first-cost.

## BROWN BOVERI MECHANICAL RECTIFIER

**P**RACTICAL experience of over 10 years in aluminum, chlorine and other electro-chemical plants throughout the world has clearly demonstrated the outstanding qualities and overall economy of the fully compensated Brown Boveri mechanical rectifier for 60 or 50 cycles operation:

The excellent operating performance of Brown Boveri mechanical rectifiers is due to the application of the following design principles:

- 1—Operating with near to unity power factor, even for wide voltage range, by the use of load tap changing.
- 2—Relieving main contacts of any switching duty by means of a thyatron shunt circuit and auxiliary magnetization of the commutating reactors.
- 3—Automatic timing of the commutation period resulting in stable operation under any load conditions regardless of supply voltage fluctuations.

All of the above features result in practical immunity of these rectifiers to arc-backs from all causes, low contact wear, low maintenance and correspondingly low service costs.

Easy to install, requiring little space, Brown Boveri Mechanical Rectifiers are proving to be quickly self-liquidating investments—the direct result of substantial power savings and uninterrupted operation. It will pay you to get ALL the facts.

Write for data TODAY!



### BROWN BOVERI CORPORATION

19 RECTOR STREET • NEW YORK 6, N. Y.

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on  
your  
**Electrolytic  
Processes**  
with the  
**COMPLETELY  
COMPENSATED**

**97%  
EFFICIENCY**  
(at 280 Volts)  
**8,760 Hours  
a Year!**

#### MINIMUM MAINTENANCE

**Practically no  
contact wear  
after 7,800 hours**

An inspection of the contacts in the above equipment—made after 7,800 hours of continuous service—showed them to be in very good condition. They were returned to service for thousands of additional hours of "round-the-clock" operation.

#### SAFETY

**Protection in action offered  
by chemical resistant  
coveralls . . .**

material is tough and strong, yet cool and not scratchy or stiff

Made of a light-weight, tough, acid and alkali-resistant Vinyon-N fabric, these chemical resistant coveralls are designed to be comfortable to the working man while he is working—not just while he is standing still. Though they are made from a relatively expensive fabric for complete resistance to chemicals and laundings, and are offered at competitive prices, coveralls are cut extra full for active men. Pleated back, deep armpits and crotch, and deep pockets create comfort and roominess.

The material is tough and strong, yet is stated to be cool, smooth, and not stiff or scratchy. Admiralty gray in color, it will not show dirt readily. Fabric, reportedly, is not affected by concentrated mineral acids and alkalis, and has high resistance to a wide variety of inorganic acids, bases, and salts. It is immune to bacteria and mildew. Pockets and thread are made of the same chemical-resistant, synthetic fiber.

Features for extra convenience include two breast pockets, pencil pocket, two side pockets with access slots to inner pockets, two double-reinforced hip pockets, and a roomy tool pocket. Coveralls have snap-cuff trousers. Full zipper front has two pulls, at top and bottom. All strain points are bar-tacked for extra strength.

(Feon coveralls are products of Filtration Fabrics Div., Filtration Engineers, Inc., Dept. CP, 155 Oraton St., Newark 4, N. J. . . . or for more information check CP 8248 on handy form, pgs. 2-3.)



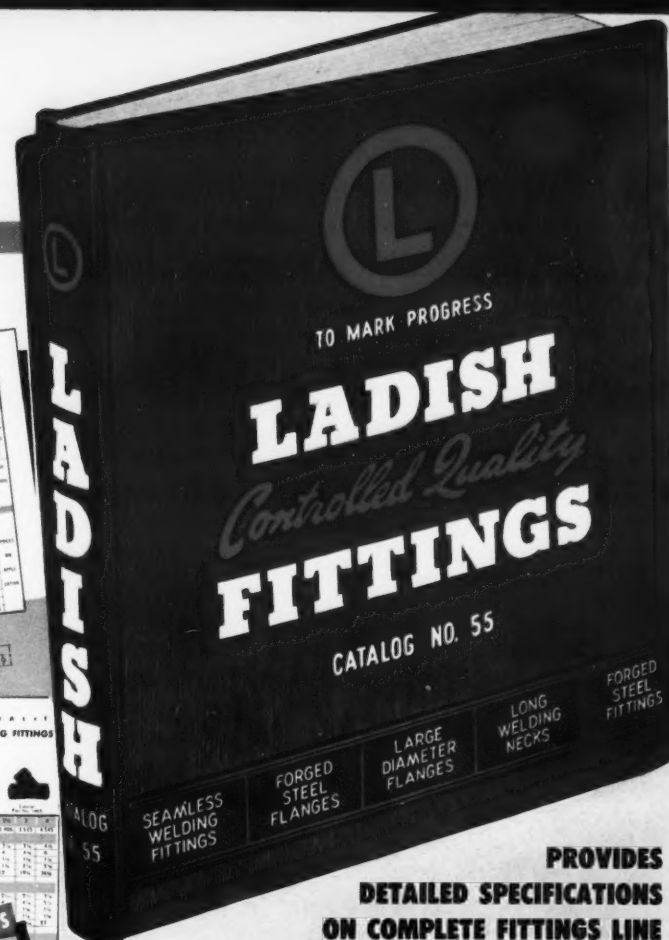
Coveralls are cut extra full for active men

When inquiring check CP 8247 on handy form, pgs. 2-3

For more information on product advertised at right, specify CP 8249 . . . see information request blank between pages 2 and 3.

CHEMICAL PROCESSING

SEND FOR YOUR NEW  
**304-PAGE LADISH**  
**FITTINGS CATALOG NOW**



**PROVIDES  
DETAILED SPECIFICATIONS  
ON COMPLETE FITTINGS LINE  
...PLUS USEFUL TECHNICAL DATA**

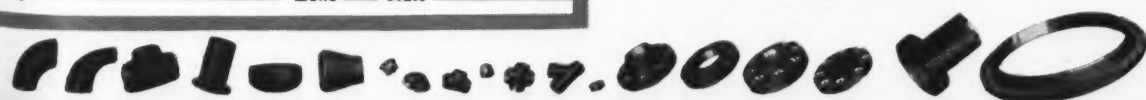
Here are detailed dimensions, weights and specifications to assist in selecting proper fittings for any application...plus useful engineering and technical data. Major sections include:

- 68 PAGES BUTT WELDING FITTINGS**  
Available in Standard through Double Extra Strong weights...in sizes  $\frac{1}{2}$  through 42 inches.
- 56 PAGES FORGED STEEL A.S.A. FLANGES**  
Available in 150 through 2500-pound pressure ratings...in sizes  $\frac{1}{2}$  through 24 inches.
- 20 PAGES LARGE O.D. AND T.E.M.A. FLANGES**  
Available in a complete range of types and pressure ratings...in sizes up to 160 inches in diameter.
- 7 PAGES LONG WELDING NECK FLANGES**  
Available in 150 through 2500-pound pressure ratings...in sizes from 1 through 24 inches.
- 5 PAGES FORGED WELDLESS ROLLED RINGS**  
Available in diameters up to 240 inches in a wide variety of forged contours...in weights up to 40,000 pounds.
- 20 PAGES FORGED STEEL FITTINGS**  
Screwed and Socket-Welding types in 2000 through 6000-pound pressures, sizes  $\frac{1}{8}$  through 4 inches.
- 12 PAGES STAINLESS AND ALLOY FITTINGS**  
Featuring data on properties of materials and a comprehensive table of piping specifications.
- 56 PAGES TECHNICAL DATA TO SIMPLIFY PIPING DESIGN PROBLEMS**

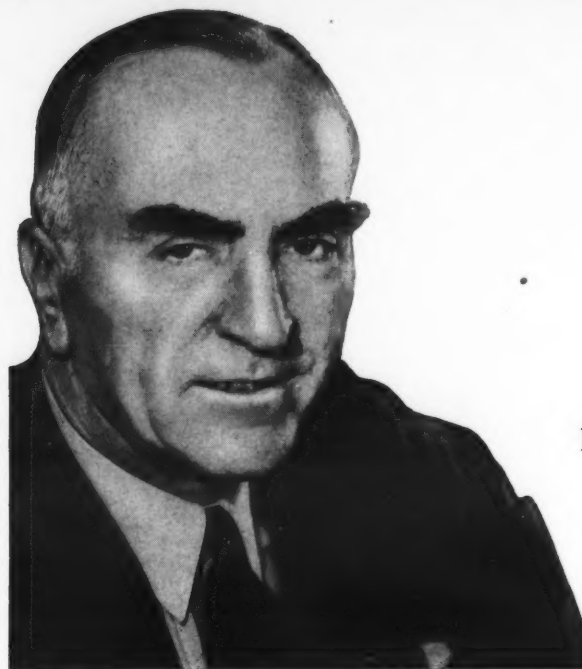


**LADISH CO.**  
Dept. CP, Cudahy, Wisconsin  
Please send me, without cost or obligation, the new 304-page  
Ladish Fittings Catalog No. 55.

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Title \_\_\_\_\_  
Company \_\_\_\_\_  
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*"At Eastern Air Lines our key  
men in operation, maintenance,  
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Chairman of the Board and  
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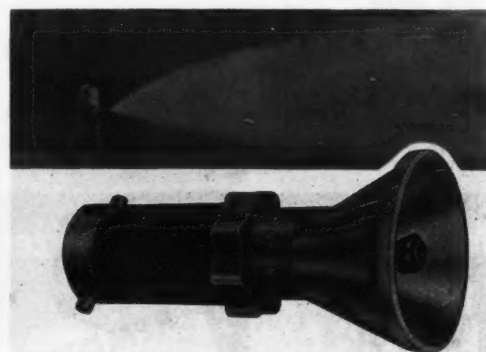
### Higher capacity, more coverage in fog nozzles for 1 1/2" lines . . .

gradual shut-off works against danger of back-pressure damage to hose or pumps

**Uses:** Two models of nozzle are for 1 1/2" hose. The G-15 model is recommended whenever maximum reach and coverage are required and when water pressure and supply are adequate. The G-10 model is suggested for inside fire fighting where it is desired to keep water damage to a minimum, or for use on long 1 1/2" lines where water or pump capacity are limited.

**Features:** Stated to provide more coverage, higher capacity and better stream break-up. No strainers are necessary as both nozzles are self-cleaning and non-clogging. Shut-off is gradual enough to work against danger of back-pressure damage to hose or pump.

**Description:** The G-15 model has a fog capacity of 50 gpm and a straight stream capacity of 100 gpm; G-10 model has a fog capacity of 25 gpm and



Upper view shows fog pattern of nozzle for 1 1/2" fire line. Details of construction of nozzle which is available in two fog capacities: 25 and 50 gpm

a straight stream of 50 gpm at 100 psi. Each is constructed of polished stainless steel and chrome plated brass parts. Turning the handle changes the nozzle from off to fog, then to straight stream. In the straight stream position, the central core of the nozzle is completely removed, leaving a straight-through waterway which flushes out all dirt.

(Announced by Bete Fog Nozzle Inc., Dept. CP, 85 Pierce St., Greenfield, Mass. . . or for more information check CP 8250, pages 2 and 3.)

### Explains foam fire protection

Booklet gives 16 pages of basic information on mechanical and chemical foam used in fire-fighting.

"Foam Fire Protection" is issued by National Foam System, Inc., Dept. CP, Union and Adams St., West Chester, Pa. When inquiring specify CP 8251 on handy form, pages 2 and 3.

## In electrical installations where **QUALITY** counts use **CONDULETS\***

Quality does count in practically every electrical conduit installation that you make. When you use CONDULETS you know that you are putting in electrical equipment of the highest quality, because CONDULETS have been doubly tested . . . in the factory and in the field.

Crouse-Hinds quality control assures a long-lasting product and field records prove it by the test that only time can give. Thousands of CONDULET installations are still in tip-top condition after twenty, thirty, or even more than forty years of dependable service.

The illustration at the right shows four of Crouse-Hinds' basic quality features that are common to all CONDULETS. The fifth, Wedge Nut Fasteners, is an exclusive Crouse-Hinds feature that has made Obround CONDULETS preferred by electricians everywhere.



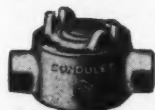
Type EVA Explosion-Proof Lighting Fixture



Type ARE Arktite Receptacle Equipment



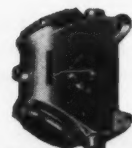
Type FS Condulet With Pilot Lamp Receptacle, Switch and Plug Receptacle



Type GUAC Explosion-Proof Junction Condulet



Type VC Vaportight Industrial Lighting Fixture



Type FLF Explosion-Proof Manual Motor Starting Switch Condulet



Type EPC Explosion-Proof Motor Starter and Circuit Breaker Condulet

- 1. Taper tapping.** Condulet threads are taper tapped to match tapered conduit threading. Makes a rigid joint that will not loosen. This assures permanent ground continuity . . . important for safety.
- 2. Integral bushing.** A smooth rounded surface protects wire insulation.
- 3. Material.** Feraloy . . . a special alloy that is strong and tough, resists corrosion, and gives sharp, full threads.
- 4. Finish.** A triple treatment provides long-lasting protection . . . exceeds Federal and U. L. specifications.
- 5. Wedge Nut cover fastener.** Clear cover opening . . . no projections. No loose parts . . . Wedge Nuts and screws self-retained. No screw holes to align.

More than 15000 items are listed in the Condulet Catalog including a complete explosion-proof and dust-tight line for use in hazardous locations.

On your next job, use CONDULETS . . . they're made right to last longer.

**\*CONDULET is a coined word registered in the U. S. Patent Office. It designates a product made only by the Crouse-Hinds Company.**

### CROUSE-HINDS COMPANY Syracuse 1, N. Y.

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CONDULETS · TRAFFIC SIGNALS · AIRPORT LIGHTING · FLOODLIGHTS

When inquiring check CP 8252 on handy form, pgs. 2-3



# Scott AIR-PAK



## Cool, fresh AIR in hazardous atmospheres!

Why take chances in explosive atmospheres when you can be assured of perfect safety with the Scott AIR-PAK. Breathe cool, fresh AIR with confidence and comfort.

It goes on and is ready for action in seconds. Just turn on the valve and you're ready to go. No complicated training or practice is necessary.

Other exclusive AIR-PAK features include a large-dial easy to read gage for constant, dependable check of remaining air supply. Cool air absolutely prevents lens fogging. The AIR-PAK is the most economical all-purpose breathing protection available. Operates for as little as 50c per hour with no waste.



For complete information  
write today!

**SCOTT AVIATION CORP.**  
242 ERIE STREET LANCASTER, N. Y.

Canada: Safety Supply Co., Toronto — Branches in principal cities.  
Export: Southern Oxygen Co., 15 West 57th Street, New York 19, New York

When inquiring check CP 8253 on handy form, pgs. 2-3

### SAFETY

**Plastic barrier rope  
resists acids and  
corrosion . . .**

yellow and black strands  
give high visibility

Polyethylene plastic barrier rope  
is made easy to see by alternating  
two strands of yellow with one



Strands are black and yellow

of black. It will not support  
combustion, absorb dirt, sag, or  
stretch. It is not affected by oil  
and has good dielectric properties.  
Rope is supplied in 5/16"  
diameter.

(Ipco Poly-rope is a product of  
Industrial Products Co., Dept.  
CP, 2834 N. Fourth St., Philadel-  
phia 33, Pa. . . or for more  
information check CP 8254 on  
handy form, pages 2 and 3.)

**Fire-fighter schools show  
techniques for handling  
problem fires . . .**

eleven separate three-day courses  
offered in spring-summer sessions

A series of three-day industrial fire-  
fighting schools will be held this  
spring and summer. Sponsored by  
Ansul Chemical Co., course shows  
latest techniques in extinguishing  
problem fires peculiar to the par-  
ticular industry of the enrollee.

Attendance at the school is free,  
the students paying only for trans-  
portation and living costs while in  
Marinette, Wis. Students use  
hand, wheeled and large stationary  
models of dry chemical equipment  
against a wide variety of fires, in-  
cluding many types of flammable  
liquid and propane gas fires.

Starting dates for classes are May  
24; June 14, 21, 28; July 19, 26;  
August 16, 23, 30; Sept. 13, 20.

(Information regarding enrollment  
can be obtained from Ansul Chem-  
ical Co., Dept. CP, 3300 Hegley  
St., Marinette, Wis.)

**USE THIS NEW SAFETY MATERIAL  
ALL OVER  
YOUR  
PLANT**

Work platforms



Flooring



Gutter Covers



Partitions



**Safety**  
**GRIP-STRUT**  
**NON-SKID — RUGGED — LOW COST**

Safety Grip-Strut is a new basic material. All  
one piece, steel or aluminum, in various sizes  
and gauges. Sold like lumber, used like lum-  
ber and stocked in your storeroom like  
lumber. Ideal for on-the-job fabricating. Not  
welded, riveted or expanded. It presents an  
open space, in a diamond shaped pattern, in  
excess of 75% of the area for ready access of  
light and air and gives a positive NON-SKID  
footing in all directions. Ideal for stair treads,  
fire escapes, cable trays, work platforms, cat-  
walks, flooring and for original equipment  
safety treads. Your own mechanics can install  
it — it's inexpensive, yet permanent and safe.  
Write today for new catalog showing  
loadings and methods of easy application in  
your plant.

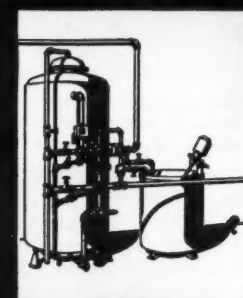
Distributors in all principal cities.

**GRIP-STRUT division**  
**THE GLOBE COMPANY**

Manufacturers since 1914  
4006 S. Princeton Ave. • Chicago 9, Ill.

When inquiring check CP 8255 on handy form, pgs. 2-3

## Mixed-Bed Ultra Delonizer



**REMOVES  
ALL MINERAL  
IMPURITIES  
FROM WATER  
for as little as  
18c per  
1000 gallons**

The Elgin Ultra-Deionizer  
produces water of even higher  
quality than obtained by distillation or evaporation at  
a mere fraction of the cost. It is a compact, easy to  
operate unit which requires very little space. Contain-  
ing a mixture of cation and anion exchange resins in a  
single tank, it is low in investment and operating cost.  
Ask for Bulletin 512.

**ELGIN-REFINITE**

DIVISION OF ELGIN SOFTENER CORPORATION  
180 NORTH GROVE AVENUE, ELGIN, ILLINOIS

**OTHER PRODUCTS** Softeners • Dealkalizers • Lime Soda Softeners  
Write for Bulletins • Deaerating Heaters • Filters • Treatments

When inquiring check CP 8256 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## SAFETY

### Direct reading SO<sub>2</sub> detector designed for portability . . .

three squeezes on aspirator bulb gives reading in per cent SO<sub>2</sub>

**Uses:** Quickly determines percentage of sulfur dioxide in atmosphere. May be used by power plants and other large volume users of coal and other fuels to check the SO<sub>2</sub> concentration in smoke stacks.

**Features:** Portable instrument reads from 0 to 50 ppm of sulfur dioxide.

#### Description:

Operator squeezes aspirator bulb three times for an adequate air sample, then reads SO<sub>2</sub> concentration on graduated scale. Reagent in tester tube turns from blue to white, with length of decolorization directly proportional to per cent SO<sub>2</sub> in sample.

(Detector is a product of Mine Safety Appliances Co., Dept. CP, Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa. . . or for more information check CP 8257 on handy form, pages 2 and 3.)



Measures 0-50 ppm sulfur dioxide

### Moisture-proof plastic hat is molded in one-piece . . .

passes required tests for impact-resistance, pierce-resistance and dielectric strength

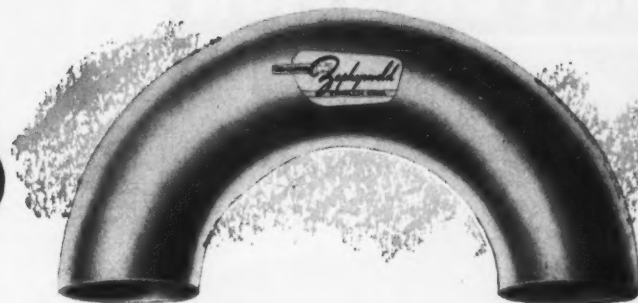
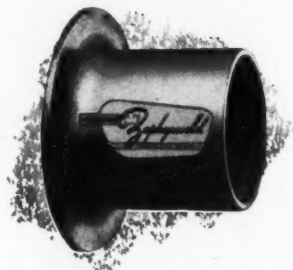
**Uses:** Protective headgear.

**Features:** Designed with streamline contours to deflect effectively either falling or flying objects. Ample clearance between hat shell and skull provides an extra margin of safety and aids air circulation. Hat is stated to pass all required tests for impact-resistance, pierce-resistance and dielectric strength.

**Description:** Super-Tough Hat has a shell that is molded in one-piece of lightweight, moisture-proof plastic. There are two styles: No. 1 has "buffer" type vinyl headgear with leather sweatband and elastic chin strap; No. 2 has a lighter type vinyl headgear, also with leather sweatband. Either style of headgear is attached to the hat by six suspension points which are molded into the interior of the shell so that no rivets or lacing pierce the hat.

The headgear assembly can be changed in seconds, and the adjusting strap is marked by headsizes to make proper fitting easy. Standard color for the hat is green, but red, yellow, brown and white are also available.

(Product of Willson Products, Inc., Dept. CP, Reading, Pa. . . or for more information check CP 8258 on handy form, pages 2 and 3.)



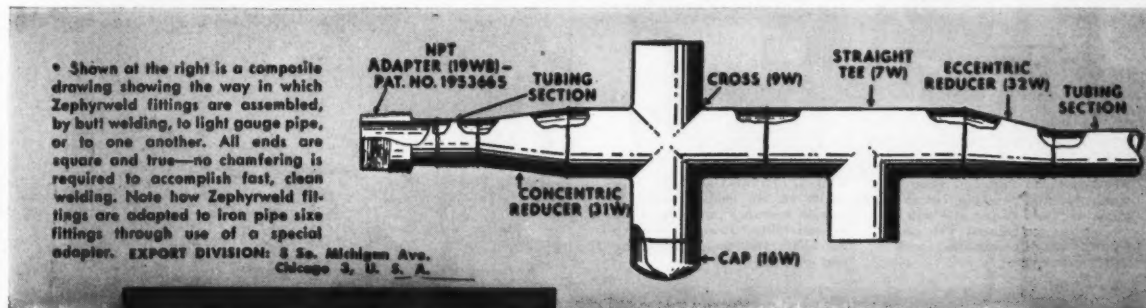
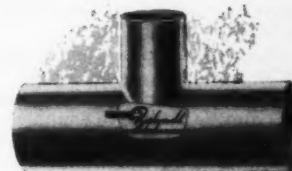
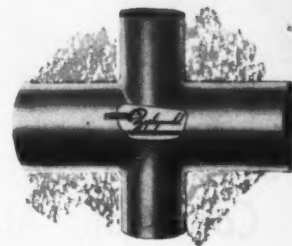
### ZEPHYRWELD® WELDING FITTINGS

• TRI-CLOVER offers the most complete line of Zephyrweld Schedule 5 and 10 stainless steel welding fittings in sizes from 1/2" through 24" and 36" for use with stainless steel light gauge pipe. In addition, Schedule 40 fittings are available in sizes through 24".

These porosity-free fittings are fabricated from stainless steel types 304, 347, 316 and other stainless steel analyses . . . and are annealed, pickled and passivated in sizes through 4". Larger sizes are passivated and may be annealed upon request.

Schedule 5 and 10 fitting ends are cut flush for rapid welding. Because of their light gauge, no chamfering is required. Schedule 40 fittings are beveled in accordance with ASA specifications.

In addition to butt welding pipe fittings, Tri-Clover manufactures a complete line of stainless steel tube O.D. butt welding fittings for use with light gauge tubing.



• Shown at the right is a composite drawing showing the way in which Zephyrweld fittings are assembled, by butt welding, to light gauge pipe, or to one another. All ends are square and true—no chamfering is required to accomplish fast, clean welding. Note how Zephyrweld fittings are adapted to iron pipe size fittings through use of a special adapter. EXPORT DIVISION: 8 So. Michigan Ave. Chicago 3, U. S. A.

**Tri-Clover**  
MACHINE CO.  
Kenosha, Wisconsin

TRI-ALLOY AND STAINLESS STEEL  
SANITARY FITTINGS, VALVES,  
PUMPS, TUBING, SPECIALTIES

THIS Complete LINE

FABRICATED STAINLESS STEEL  
INDUSTRIAL FITTINGS AND  
INDUSTRIAL PUMPS

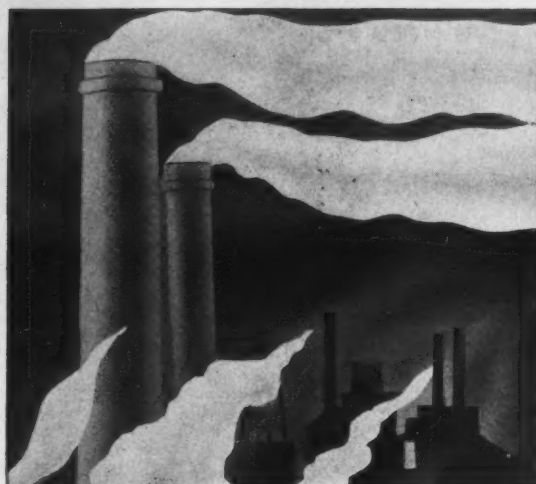
Our experienced engineering service is at your disposal to help solve your specific corrosion-resistant piping problems.

Write for further details, or see your nearest Tri-Clover Distributor.

When inquiring check CP 8259 on handy form, pgs. 2-3



# AIR POLLUTION



## Study Of Meteorological Conditions Above New Plant Site Urged

Looking for a new plant site? To buy or build? Then take the word of industrialists and scientists, who are using the newest techniques in the study of air contaminants:

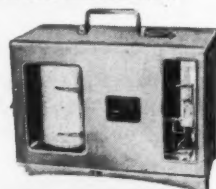
Study the meteorological conditions at various altitudes as well as ground level.

Knowledge of temperature, humidity, time, windspeed and direction can save you money.

Bendix-Friez, foremost maker of meteorological instruments in the world, offers all its facilities and experience with industries, to help you find a practical approach to minimize your air pollution problems . . . now or before they start without costly moderation of present equipment. Write for further information.



**AEROVANE** indicates and records windspeed and direction. Recognized as "best all-purpose wind measuring instrument yet devised." Readily installed and easily maintained.



**HYGRO-THERMOGRAPH** The leader in its field. Noted for precise accuracy and long-time dependability. Records relative humidity and temperature on one graph.

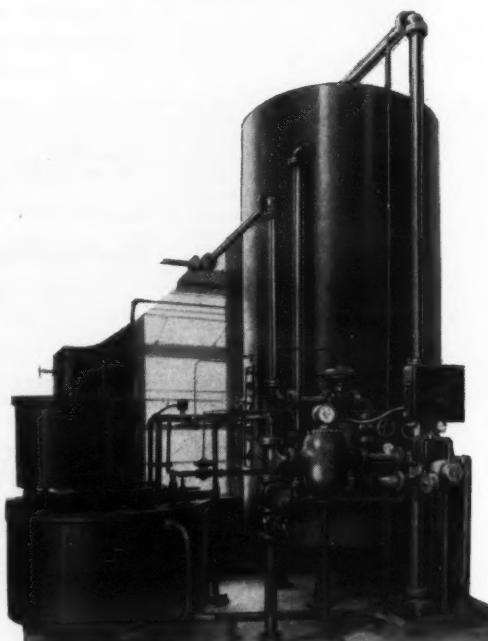
**FRIEZ INSTRUMENT**  
Division of  
  
AVIATION CORPORATION  
1450 Tayler Ave., Balto. 4, Md.  
EXPORT SALES  
Bendix International Division  
205 E. 42nd St., New York 17, N.Y. U.S.A.

When inquiring check CP 8260 on handy form, pgs. 2-3

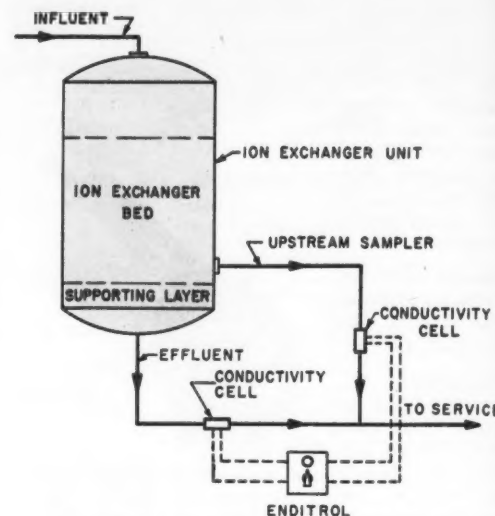
## automatically determines endpoint in ion exchange

Conductance measurements show when ion exchange bed is no longer able to displace free acid from salts

Both of the commonly used methods for setting an "endpoint" for hydrogen zeolite ion exchangers have drawbacks. Titration is capable of finding a true endpoint, but is tedious. Passing only a fixed volume of water through the bed is common practice — though the bed may be exhausted before this volume has been put through, or may



## instrumentation & control



Conductivity of sample stream and effluent are compared in instrument

still have appreciable capacity when retired.

Titration is a particularly time consuming task. The oftener titrations are made, the more total time they take. Since the bed gives little prior notice of exhaustion, however, widely spaced titrations are liable to lead to running with exhausted zeolite.

Fixed volume operation depends on a safety factor. This means wasted zeolite. With waters of varying composition water meter is usually reset to compensate. Since changes take place very rapidly in many cases, this is another chance for over- or under-runs.

An electrical instrument has been developed which will monitor demineralized water output. It sounds an alarm when bed is exhausted or can initiate regeneration of the bed. Operation is based on the fact that in a downflow bed, exhaustion starts at the top and works downward. Bottom of the bed is last to be exhausted.

In a hydrogen cation exchanger, sodium, magnesium, and calcium atoms are taken up. Hydrogen is substituted for them. This produces carbon dioxide, and hydrochloric and sulfuric acids. During most of the run acid concentration remains quite constant. But near end of run it decreases very rapidly. In most cases, operation can be terminated when mineral acidity falls to 90% of average. In critical cases exchanger is shut down earlier.

In order to do this automatically, sample stream is drawn off just above bottom of the bed. Difference in acid content between this stream and exchanger output stream indicates when exhaus-

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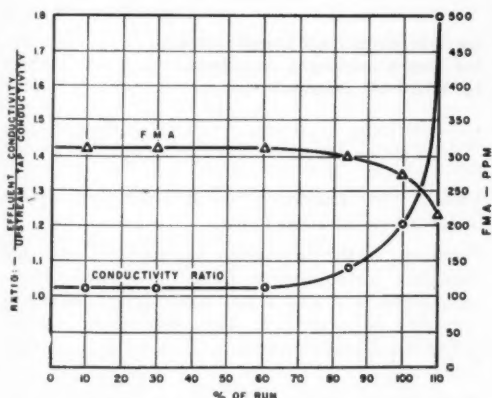
tion has reached sampling level. Best sampling point varies with composition of water being treated; it is usually 4 to 8" above bottom.

To compare acid content of streams, they are passed through conductivity cells. During most of the run they are almost identical — ratio of conductivity is 1.0. But since hydrogen ions have greater conductivity than ions of the metals replaced, output near end of run has a greater conductivity than sample. Maximum conductivity ratio of the two streams also varies. Depending on position of sample tap, ratio may range from 1.2 to 3.0.

Water travels through the column fast enough to make time lag negligible. In a typical case, water rate through the column would be about 1 to 2 ft/min. Less than a minute would thus be spent by water traveling past sample tap to output. Since water composition could never change this fast, time lag is of no importance.

When conductivity ratio does change, therefore, all but the last 4 to 8" of bed have been exhausted. System can be equipped to sound an alarm or to switch to another column or start regeneration. Several installations of the equipment are working satisfactorily.

Anion exchanger units can also be controlled. Unit would be of particular value where silica removal is a prime object. In such installations (mixed bed or two-step), effluent conductivity



Conductivity ratio of sample to effluent accurately predicts a rise in free mineral acid for hydrogen cation exchangers

does not change much at the time silica begins to slip through. But if sampling tap is located far enough from bottom of bed, strong acids there occur just when weak silicic acid is beginning to appear in output. Tests show, in fact, that since mixed bed or two-step exchangers demineralize water, conductivity at sample tap itself is a sufficient measurement. No comparison to effluent need be made.

(Named the "Enditrol," endpoint indicator is made by The Permutit Co., Dept. CP, 330 W. 42nd St., New York 36, N.Y. . . . or for more information check CP 8261, pages 2 and 3.)

## THE VALVE THAT CONQUERS FLASHING CONDENSATES

**Better Control, with Lower Initial and Maintenance Costs**

Use Annin valves for better control of steam and condensates to 2500 PSI and 900° F without use of hard-to-maintain special assemblies. Flanged seat ring eliminates seal welding. Body construction eliminates liners and reduces down stream piping erosion. Available with manual, cylinder or Domotor automatic operators. Single seat provides bubble-tight shut-off. For better control, longer life, and lower maintenance use ANNIN CONTROL VALVES.

**THE ANNIN COMPANY**

6570 E. Telegraph Road, Los Angeles 22, California

**ANNIN**  
*Control*  
**VALVES**



WRITE TODAY FOR ILLUSTRATED CATALOG 1500 B

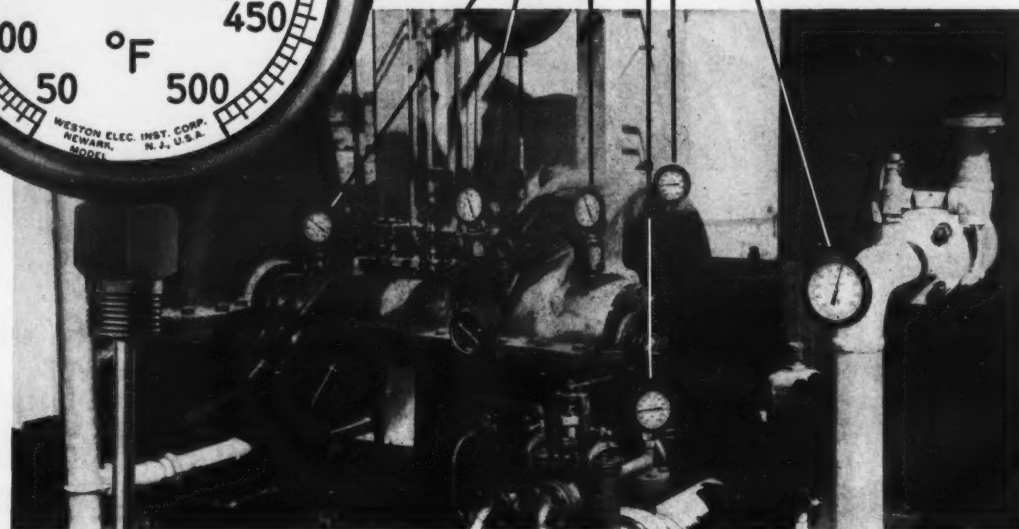
You'll profit by learning more about the superior features and better performance of Annin Control Valves.

When inquiring check CP 8262 on handy form, pgs. 2-3





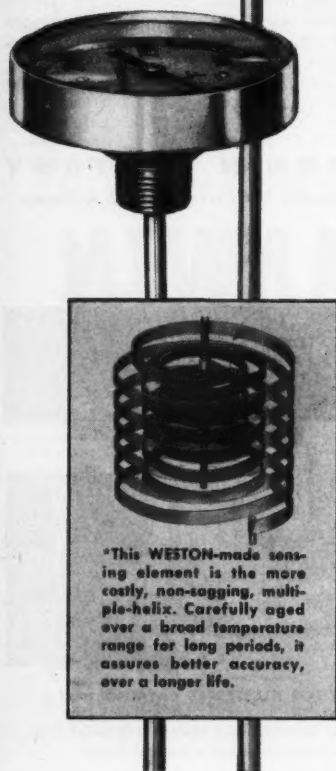
**AT EVERY  
CHECKPOINT**



## WESTON all-metal THERMOMETERS (with Multiple Helix\*)

Here's another typical example of how large processing plants have solved temperature checking problems, and cut thermometer costs besides. With a WESTON dial-type thermometer at every checkpoint, temperatures are read at a glance . . . in far less time, and with far greater accuracy. Their sturdy all-metal construction resists breakage, gives them far longer life on operating equipment. And the exclusive WESTON multiple helix employed assures dependable accuracy during all this long life.

Available in a broad selection of types, sizes, ranges and stem lengths, WESTON thermometers are today standard on all types of mobile and stationary equipment and machines, large and small; as well as on piping, conduit, ducts, etc. Ask your distributor, or local WESTON representative for complete information, or write for descriptive bulletin . . . WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, New Jersey.



\*This WESTON-made sensing element is the more costly, non-tagging, multiple-helix. Carefully aged over a broad temperature range for long periods, it assures better accuracy, over a longer life.

**WESTON**  
5537

*Thermometers*

Stocked  
by leading  
Distributors

When inquiring check CP 8263 on handy form, pgs. 2-3

## INSTRUMENTATION

**Adjust sensitive relay to operate  
at inputs from 0.25  
to 5 milliwatts . . .**

instrument handles over 200 w, and has an amplification of almost  $10^6$

**Uses:** As plate relay or in other minimum power-demand application.

**Features:** Currents of approximately 0.1 ma will engage relay at its minimum engagement-power setting. At maximum power demand, engagement-current setting can be as high as 0.5 ma.

**Description:** Relay, available in SPST and SPDT constructions, will engage at its minimum power requirements on 0.25 milliwatts. Engagement-demand can be continuously adjusted over the whole range to 5 milliwatts. Relay allows extremely fine adjustments over a wide range of its engagement-demand to its drop-out demand. The unit's load contacts are rated at 2 amps (non-inductive) at 110v. Essentially a DC relay, unit is also furnished with built-in selenium rectifiers for AC duty.

(Model SS-1-0.D Relay is a product of Techniflex Corp., Dept. CP, Port Jervis, N.Y. . . . or for more information concerning manufacturer's product, reader may simply check CP 8264 on the convenient Reader Service slip which is located between pages two and three.)

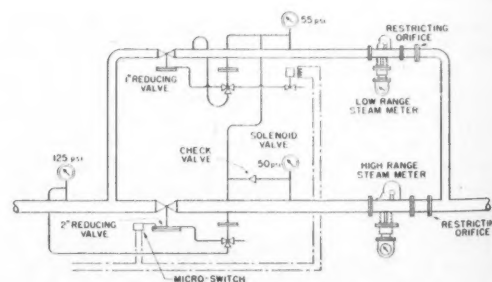
**Switch large and small meters  
for more accurate readings  
to 1000-lb steam/hr . . .**

switching is automatic; operation depends only on steam demand

**Uses:** For measuring rate of steam consumption in the range to 1000 lb/hr.

**Features:** Metering system automatically switches back and forth between large (1000 lb/hr maximum capacity) and small (150 lb/hr maximum capacity) steam meters. Thus readings in the low range are just as accurate as readings at high steam rates.

**Description:** Package metering system provides for shunt flow of steam through 2" line and 1" line. Each leg of shunt contains reducing valve



Low flows pass through 1" line (upper); heavier flows pass through 2" line (lower)

and steam meter. In actual installation, use of 1" and 2" lines and meters has resulted in accurate measurement over a flow range of about 67 to 1.

Reducing valve in 2" line is set to maintain system pressure of 50 psig and 1" valve is set to maintain pressure of 55 psig. Normally open, spring-loaded microswitch is mounted on travel indicator of 2" reducing valve. This operates a solenoid valve in the 1" line. As load diminishes, throttling of 2" reducing valve closes microswitch, and solenoid valve in 1" line becomes energized to open pressure-regulating valve there. This brings system pressure to 55 psig and closes reducing valve in the 2" line. Two-inch line cannot come into operation until system pressure drops to 50 psig.

(Packaged system incorporating Squires pressure reducing valves and Shuntflo has been developed by B-I-F Industries, Dept. CP, 345 Harris Ave., Providence 1, R. I. . . or for more information check CP 8265 on handy form, pages 2 and 3.)

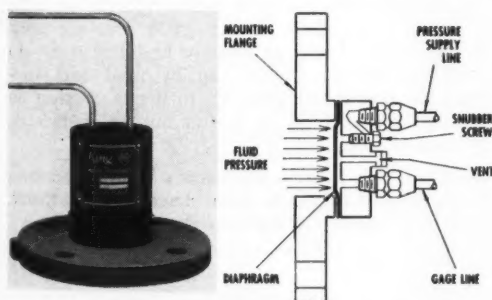
#### Measure pressure to 45 psig with force balance . . .

1 to 1 pneumatic transmitter gages depth in tanks without bubble tube

**Uses:** Measures pressure of liquids and gases, or depth, weight, or volume of liquids in vented and pressurized tanks.

**Features:** Pressure transmitter has diaphragm exposed to fluid or gas to be measured. Unit provides a positive seal between gaging system and material being measured.

**Description:** One-to-one transmitter has linear response from 1/2" water upward. Transmitter permits accurate readings at pressures to 20 psig



Pressure applied to diaphragm by fluid in tank is balanced by air pressure. Imbalance results in opening or closing of vent to return transmitter to balance

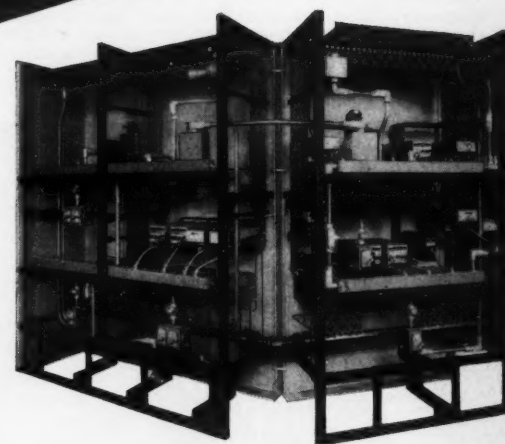
in vented tanks, and to 45 psig in pressurized tanks. Hydrostatic gages, manometers, and pneumatically-actuated recorders or controllers may be used as receivers.

(Pressure transmitter is a product of King Engineering Corp., Dept. CP, P.O. Box 540, Ann Arbor, Mich. . . check CP 8266, pgs. 2 & 3.)

## Creative Contributions to Centralized Process Control . . .

# GRAPHIC PANELS

by **FOXBORO**

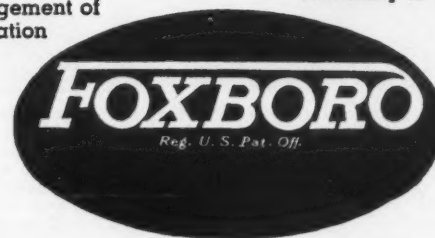


Years of experience in panel design and construction have equipped Foxboro Panel Engineers with many exclusive techniques . . . methods which bring you unequalled performance in centralized process control.

One typical feature is the use of aluminum strips and shapes, three-dimensional in effect, in bright, permanent colors, to symbolize flow lines and vessels. These are securely attached over the background finish, yet may readily be rearranged when necessary without marring the finish or leaving ugly holes. (If you prefer, painted graphic panels can be furnished.)

Behind the panel, Foxboro's open framework construction and the neat, clean arrangement of piping and wiring permit quick installation and far easier maintenance.

Foxboro's skilled Panel Assembly Department completes the team which provides you with the most efficient and usable Graphic Panels available today. Let us work up a detailed proposal for you.  
**The Foxboro Company,**  
815 Neponset Ave.,  
Foxboro, Mass.



**PROCESS CONTROL ENGINEERING**

FACTORIES IN THE UNITED STATES, CANADA, AND ENGLAND

When inquiring check CP 8267 on handy form, pgs. 2-3

Typical back-of-panel view. Note open framework construction (easily enclosed if desired), terminals tagged for quick identification in field, neat arrangement of tubing and wiring, full accessibility to all instruments.



# How would YOU solve these two problems?



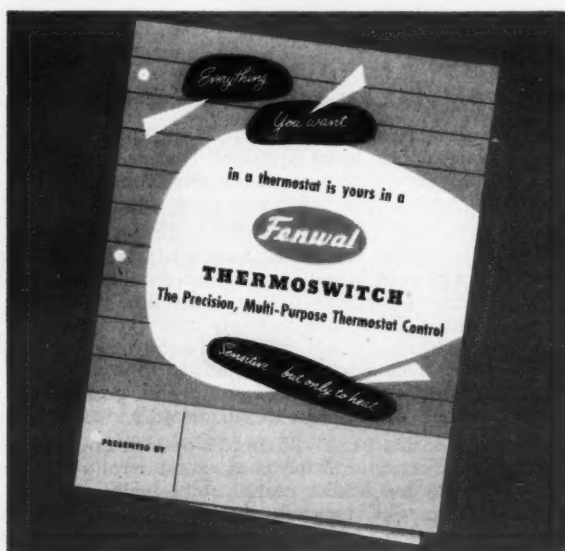
**1. A PATCH AHEAD OF TIME**, applied at the factory, reinforces the knees of dungarees and overalls. Patches are vulcanized under pressure with Radio Frequency Corp.'s high frequency, dielectric heater. If dielectric heat, generated in the material, is lost through conduction, vulcanization becomes inefficient. But Fenwal THERMOSWITCH® units in each platen minimize these losses by close temperature control. Vulcanizing 3000 patches per hour is now standard; 30 was.



**2. DENTAL PLATE FIT STARTS WAY BACK.** The tiny abrasive wheels for grinding and polishing dental plates must be very accurately molded of fine abrasive in a rubber base. The molds in which they're made must have delicate temperature control for consistent quality and uniformity. The manufacturer, The Wm. R. Hall & Son Co., uses THERMOSWITCH units in molds for accurate, reliable temperature control. Production figures can be kept high while rejects are low.



**3. THIS IS IT** — the Fenwal THERMOSWITCH control is simple — compact shell contracts or expands *instantly* with temperature changes, opening or closing electrical contacts. Adjustable and highly resistant to shock and vibration. Fenwal THERMOSWITCH units are solving temperature problems and helping to improve the final product throughout all industry.



**4. SEND FOR THIS BROCHURE** for complete explanation of the unique THERMOSWITCH unit. Also ask for more detailed, illustrated discussions of the problems above. Fenwal engineers will be glad to help you solve your temperature control problems involving heat, humidity, radiant heat, pressure and other variables. Write Fenwal Incorporated, 247 Pleasant St., Ashland, Massachusetts.



**THERMOSWITCH®**

Electric Temperature Control and Detection Devices

**SENSITIVE... but only to heat**

When inquiring check CP 8268 on handy form, pgs. 2-3

## INSTRUMENTATION

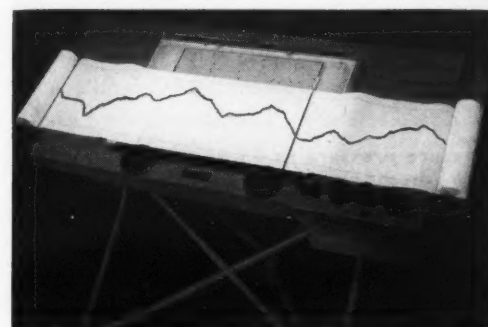
**Provides faster method for reading graphs, chart records...**

reader can be combined with digitizers, punched card or tape, or electric typewriter

**Uses:** Can be used for reading stripcharts, oscillograph or film tracings whether scale is linear or not.

**Features:** Permits operator to quickly and easily design recorded trace to within  $\pm 0.005''$  while readout device shows actual digits associated with the graph coordinance.

**Description:** Reader is a table-like device resting on tubular frame. Top of reader has a glass viewing screen, cross-wire measuring system, light sources and two calibrated dials. Both vertical



Can pin-point trace on record to within 0.005"

and angular displacement may be adjusted for operator comfort. Viewing screen is located in front of two cross-wires suspended from separate carriers. Carriers are moved by handwheels to locate record trace.

Position of cross-wires is indicated on two calibrated dials which can be positioned for an arbitrary zero anywhere within glass viewing area. Readings are shown as positive and negative. In addition, further devices can be used for automatically converting readings to digits, storing on punch cards or tape, or typing out by an electric typewriter.

(Contact Telereader is a product of Telecomputing Corp., Dept. CP, 133 E. Santa Anita Ave., Burbank, Calif. . . . check CP 8269, pages 2 and 3.)

**Need instrumentation for that process? . . .**

You'll find just what you need in the alphabetized, itemized Product Directory on pages 213 to 216. All subjects and products presented in ads and editorial columns are there.

## INSTRUMENTATION

### Hot wire anemometer measures gas velocity or mass rate . . .

variety of probes available for special service

**Uses:** For measuring high speed gases either directly in velocity or as mass flow.

**Features:** Temperature range of 0-1000°F with velocities from zero to supersonic can be handled.

**Description:** Series of probes and amplifiers are designed to use the hot wire effect. Power is fed through a precision resistance wire with standard diameter of 0.0002, 0.0005, or 0.0001". Wire is heated by electric current; passage of air or gas cools it, changing resistance. Probes are available for radial or transverse position in duct. They may be installed through 1/8" pipe tap.

Available amplifiers have good frequency response and low drift. Time constant of the hot wire element itself is very good — from 0.0004 to 0.002 sec for a 63.2% attainment of changed conditions.

(Hot Wire Anemometers are products of Aero-Research Instrument Co., Inc., Dept. CP, 1901 N. Hermitage Ave., Chicago 22, Ill. . . or for more information check CP 8270 on handy form, pages two and three.)

### Tests resistance of insulation, circuits

Bulletin illustrated in two colors contains descriptions, applications, and specifications of manufacturer's line of electrical resistance testers. Brochure covers two models of insulation testers and one circuit testing ohmmeter. Instruments are available for measuring resistance to 200,000 ohms.

Bul 21-85-62 is issued by James G. Biddle Co., Dept. CP, 1316 Arch St., Philadelphia 7, Pa. When inquiring specify CP 8271, pages 2 and 3.

For more information on product at right, specify CP 8272 . . . see information request blank between pages 2 - 3.

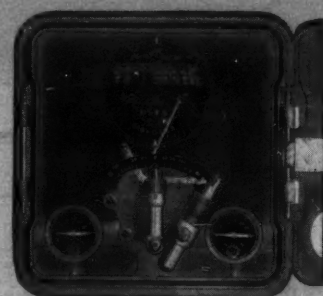
# BS&B Announces:

## ... An Even Better Pressure Controller — Climax Type 1440

The Climax Type 1440 Pressure Controller (non-recording) is designed to handle both positive and negative pressures, from high vacuum to pressures of up to 10,000 lbs. Bourdon Tube actuated — with all tubes, bellows assemblies, feed orifices and bleed nozzles calibrated — the Type 1440 is an instrument of utmost accuracy. Proportional band and On-Off or Maximum-Minimum snap action adjustment is easily made without additional parts. Snap action may be adjusted to pressures up to 75% of the limits of the Bourdon Tube rating.



## ... An Even Better Liquid Level Controller Pilot ... Climax Type 1450



The type 1450 Liquid Level Controller Pilot was developed for use and mounting on any Climax Type 888, 888-LF, 887 and 889 displacement liquid level controllers where a torsion tube transmits float movements to reflect changes in liquid level or a change in gravity of the controlled liquid. Its interchangeability of parts with those of the Type 1440 Pressure Controller is an advantage which reduces stocking parts.

Type 1450 features a very wide "throttling" range calibrated from

0% to 100%. A specific gravity index is provided and offers a method of compensating for various gravities of liquids, or for inter-face services, where the "throttling" range is kept exact in its relationship to the specific gravity setting.

A novel feature of the Type 1450 is its adjustability, without use of special parts, for "snap" or "on-off" action. This is useful when it becomes desirable for the diaphragm control valve to fully open or close when liquid level height reaches a desired "high" setting, and to react in an opposite manner at a desired "low" setting. The amount of liquid level change from open to shut positions of the control valve may be varied up to 75% of displacement element length.

Types 1440 and 1450 are but a small part of the complete Climax line—designed, engineered and precision manufactured by BS&B to meet your most exacting requirements. Send for your free copy of the complete Climax catalog!

For Better Process Controls . . . Always Specify BS&B Climax!



**BLACK, SIVALLS & BRYSON, INC.**

Climax Controls Division, Dept. 4-M5

7500 East 12th Street

Kansas City 26, Missouri

### Improved Features of Types 1440 and 1450:

1. Weatherproof case of die-cast aluminum designed for universal mounting.
2. Compact size — 8" x 8" x 4".
3. Door hinges to left or right, as desired.
4. Straight line piping.
5. Proportional bellows, calibrated, spring opposed.
6. Micro-adjusted set-point, graduated.
7. Molded diaphragms in power unit.
8. Easy parts replacement or assembly.
9. Feed orifice cleaner.
10. Snap action available over 10% to 75% of tube range without additional parts. (Applies to Type 1440 only.)
11. Pilot action reversible by moving a single link, without tools.
12. Elimination of superfluous linkages, resulting in easier adjustability and greater sensitivity.

Types 1440 and 1450 Have Been Developed and Thoroughly Field Tested for More Than Two Years!

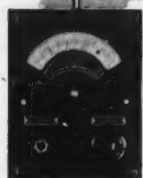




## must you pay a premium price for accurate instrumentation?

**fielden says, "no!"—**

with precise yet sensibly priced instruments like this TELSTOR Electronic Level Indicator. TELSTOR measures continuously—with accuracies to  $\pm 2\%$ —the levels of liquids, viscous fluids, powders or granular solids. Remote readings can be recorded at distances greater than one mile.



Fielden TELSTOR Electronic Level Indicator for Accurate, Continuous Level Measurement of Liquids or Divided Solids.

**Simplification** is the reason for Fielden's economical instrumentation. TELSTOR, for example, has no moving parts—no floats to stick or leak—no pneumatic or hydraulic piping. Circuitry is simplicity itself and only one vacuum tube is employed. Measuring electrode and instrument are easily installed.

Unless you really need instrumentation of extreme precision (which inevitably costs more) get the facts about Fielden. Simplified Fielden instrumentation assures *all the accuracy you can use*—at an extremely worthwhile saving in initial cost and maintenance.

**DOLLAR FOR DOLLAR—YOUR BEST INSTRUMENT VALUE**



**Robertshaw-Fulton**

CONTROLS COMPANY

**FIELDEN INSTRUMENT DIVISION**  
2920 N. 4th St., Dept. G, Philadelphia 33, Pa.

Send full details of Fielden simplified ☐ TELSTOR Electronic Level Indicator ☐ TEKSTOR Electronic Level Control ☐ TEKTOLOG Electronic Recorder.

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Fielden TEKSTOR Electronic Level Control



Fielden TEKTOLOG Electronic Recorder

SEND FOR NEW  
INSTRUMENT DATA TODAY.



## INSTRUMENTATION

### Full details provided on control valves

Running 10 pages, illustrated 2-color bulletin details motorized control valves. Diagrams, drawings, and photographs provide illustrations for detailed explanations of the text. Information on flow characteristics, critical dimensions, and valve sizing is included.

Bul Lb-1 is issued by Conoflow Corporation, Dept. CP, 2100 Arch St., Philadelphia 3, Pa. When inquiring specify CP 8274, pages 2 and 3.

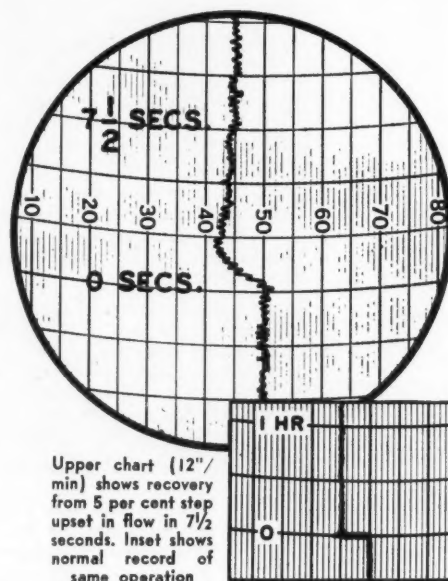
### Offers practical operation in high speed control of flow...

provision made for proportional, derivative and reset action by controller

**Uses:** High-speed flow control applications.

**Features:** Actual field tests have shown that controller is able to stage full recovery from a step upset of 5 per cent flow change in  $7\frac{1}{2}$  seconds. It provides practical follow through for use with a high-speed transmitter.

**Description:** Simple and compact pneumatic controller combines proportional, reset, and derivative control actions. Proportional band and derivative times are fixed; reset time can be field



adjusted between 0.7 and 50 seconds. Four large metal bellows operate in the sealed case to position balanced beam and apply corrective output pressure to control valve and response to process upset or control point change.

Balance beam is positioned between supply and exhaust nozzles by these bellows. Any tendency

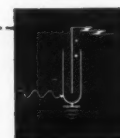
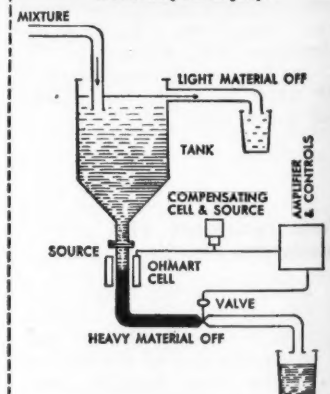
## ohmart solves tough control problems with radioactivity

Here's a typical Ohmart installation—to control the draining off of the heavy material in a tank after separation of a heavy and light materials mixture. The Ohmart Density Gauge detects the interface level as it reaches the desired point, shuts off the flow automatically! Ohmart Density Gauges are performing many other measurement and control tasks throughout industry, involving liquids, slurries, sludges, in difficult and "hidden" processes... wherever density is a function of the desired measurement. Basis of all Ohmart instruments are Ohmart Cells, which convert radioactive energy directly into electrical energy.

Ohmart instruments require —

NO HIGH VOLTAGE POWER SUPPLY—NO DIRECT CONTACT WITH PROCESS MATERIAL—NO SAMPLING—NO PROCESS INTERFERENCE—NO SPECIAL PIPING—NO PROCESS PRESSURE OR TEMPERATURE LIMITATION—NO CONTINUOUS PURGING—NO MOVING PARTS—NO COMPLICATED WIRING—NO EXPLOSION HAZARD—NO DANGER TO PERSONNEL

We invite your inquiry.



Electricity  
From  
Radioactivity

## the ohmart corp.

Department S-18  
2236 BOGEN STREET  
CINCINNATI 14, OHIO

When inquiring check CP 8275  
on handy form, pgs. 2-3

CHEMICAL PROCESSING

When inquiring check CP 8273 on handy form, pgs. 2-3

of the balance beam to move results in pressure change within controller which returns net force of bellows to zero. Total movement of parts is less than 0.010". Proportional band is fixed at 250 per cent.

(M/59 Controller has been developed by the Foxboro Co., Dept. CP, Foxboro, Mass. . . . check CP 8276 on handy form, pages 2 and 3.)

**Count ranges from 1 to 10,000  
and rates to 60,000 per min  
provided by counter . . .**

dual sequence unit permits independent setting directly to number predetermined

Electronic counter is a dual sequence unit providing count ranges for 1 to 10,000 and counting rates to 60,000 per minute in each of two channels. At end of each predetermined channel count a control output is provided in form of relay contact closure or voltage pulse. Switching between channels and reset of channels is automatic and instantaneous.

(Model 244 Predetermined Electronic Counter is a product of Potter Instrument Co., Inc., Dept. CP, 115 Cutter Mill Rd., Great Neck, N.Y. . . . or for more information check CP 8277, pages 2 and 3.)



Paper thin, this trifluorochloroethylene plastic diaphragm is capable of transmitting minute pressure variations, but remains unaffected by corrosive hydrogen peroxide. It is used to isolate pressure instruments. Inert hydraulic fluid transmits pressure on the instrument side. Although thin, diaphragm is free from porosity or weak spots and will withstand pressures of 3000 psi from either side.

(Diaphragms are produced for Trans-Sonics, Inc., by The M. W. Kellogg Co., Dept. CP, P. O. Box 469, Jersey City 3, N. J. . . . or for more information check CP 8278 on handy form, pages 2 and 3.)

## WHAT'S NEW AT BRISTOL . . . . WHAT'S NEW AT BRISTOL



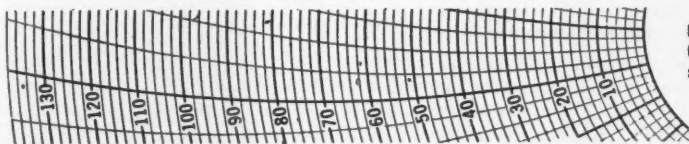
**HIGH-SPEED RESPONSE AND ACCURACY** are characteristic of the new Bristol Dual-Filled Vapor Pressure Thermometers. Unlike conventional vapor pressure thermometers, the Bristol units can be read with equal ease and accuracy throughout the entire measured range.

## Another Bristol first — Dual-filled Vapor Pressure Thermometer with uniform linear scale

• These new instruments are the latest example of Bristol's continuing leadership in the field of industrial thermometry. They represent the first really important advance in filled-system thermometer design in more than 25 years. With this new development, all the valuable features of the vapor pressure system are retained. In addition to the linear scale,

the elimination of ambient temperature effects makes new standards of accuracy possible.

Get the complete story on these rugged, precision instruments. Write for free 48-page bulletin T840. It will tell you all about typical installations, ranges, charts, bulbs and tubing. The Bristol Company, 141 Bristol Road, Waterbury 20, Conn.



**EASY-TO-READ.** This full-size section of a typical Bristol Dual-filled Vapor Pressure Thermometer chart shows the extreme clarity and definition of its uniform linear scale.

4.12

# BRISTOL

**POINTS THE WAY IN  
HUMAN-ENGINEERED INSTRUMENTATION**

**AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS**

When inquiring check CP 8279 on handy form, pgs. 2-3



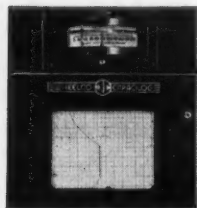


# Wheelco Recorder-Controller



## Controls temperature and fuel costs... curing cotton at HOHOKUS BLEACHERY

Maximum heating efficiency in this continuous curing oven ... built by Industrial Air, Hyde Park, Mass. ... is the result of close control provided by the Wheelco Capacilog Recorder-Controller. The Capacilog maintains temperatures within tolerances required to set cotton after bleaching and treating ... one of thousands of uses in a laboratory or process work. Use these low-cost *electronic* instruments for measuring, indicating, controlling, and recording such variables as temperatures, speed, static strain loads, a-c/d-c voltage and amperage. *They're tops* for accuracy and economy! Write for Bulletin C2-2.



### Temperature control wizard ... penny-wise on maintenance!

With the "electronic link" between measurement and control circuits, the Capacilog responds instantly to slightest changes in condition, controlling and recording within closest limits. Yet, simple interchangeable unit-construction assures continuous trouble-free operation and low maintenance costs.

BARBER-COLMAN COMPANY, DEPT. E, 1520 ROCK STREET, ROCKFORD, ILLINOIS  
Industrial Instruments • Automatic Controls • Air Distribution Products • Aircraft Controls • Small Motors  
Overdoors and Operators • Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery

When inquiring check CP 8280 on handy form, pgs. 2-3

## INSTRUMENTATION

### Explains theory and application of ultrasonic thickness gages

Illustrated four-page folder presents data on application range of thickness, accuracy, physical and electrical characteristics of ultrasonic-resonance thickness gages. Extensive listing of transducers available for uses with instruments is included. Tabulated data covers audible signal gage and visual signal gage (uses 21" cathode-ray screen).

"Ultrasonic Specifications Folder" is issued by Branson Instruments, Inc., Dept. CP, 430 Fairfield Ave., Stamford, Conn. When inquiring specify CP 8281 on handy form, pages 2 and 3.

### Minute quantities of nitric oxide in coke oven and water gas automatically measured ...

unit utilizes photoelectric color measurement

**Uses:** For automatically measuring and recording concentration of minute quantities of nitric oxide.

**Features:** Typical full-scale ranges are 0 to 0.05 ppm, 0 to 0.5 ppm, and 0 to 5 ppm although it is seldom required that more than one or two ranges be provided for any installation.

**Description:** Method consists of mixing measured quantity of gas to be tested with measured

amount of commercial oxygen in presence of butadiene which acts as catalyst. Nitric oxide present in the gas is oxidized and the mixture is then brought into contact with a measured amount of Griess solution which reacts with the oxidized NO to form as azo dye.

Color comparison is effected photoelectrically between the Griess solution before and after testing for nitric oxide. Results are registered as recorder readings which are interpreted as parts of NO per million parts of gas, grams of NO per cubic feet of gas, or in any other preferred

method of expressing concentration. Complete calibration data are supplied each analyzer.

Recording analyzer is mounted in a single steel



## DIAL THERMOMETERS

in 3 types to suit any  
requirements



Full 4 1/2" dial face.  
Stem can be placed at any angle and case can be rotated to any readable position.

**1 Rigid Stem Dial Thermometer** tapered bulb, interchangeable with standard industrial thermometer separable socket. (As illustrated above.)

**2 Wall Mounted Dial Thermometer** with flexible connecting armor. Case adjustable to easy reading position.

**3 Flush Mounted Dial Thermometer** for panel mounting with flexible connecting armor.

All three types have a full 4 1/2" dial face.

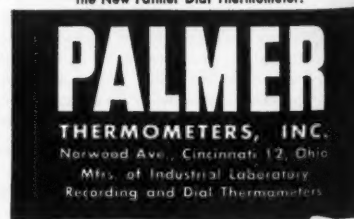
**for accuracy:** Mercury actuated ... Fully Compensated by Invar Compensation. Guaranteed Accurate 1 scale division.

**for angularity:** Can be adjusted to most readable position at any angle desired.

**for readability:** Bold Black Numbers ... 11" of scale Reading Dial face can always be placed in easiest readable position.

**for interchangeability:** Always specify "PALMER" Separable sockets as they are interchangeable for Dial or Industrial type Thermometers.

Send for Bulletin 51-129 for details on the New Palmer Dial Thermometer.



When inquiring check CP 8282 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## INSTRUMENTATION

cabinet approximately 6'2" high, maximum depth 24", maximum width 38". Commercial oxygen and butylene are supplied from external cylinders not included with analyzer.

(Analyzer is a product of the Rubicon Co., Dept. CP, Ridge Ave. at Thirty-fifth St., Philadelphia 32, Pa. . . . or for more information check CP 8283 on handy form, pages 2 and 3.)

### Two time delays but only one relay . . .

overall time delay adjustable from 0.1 sec to 10 min — first circuit contact in 0 to 15 sec

**Uses:** Provides two time delays in circuits where they are required. Momentary impulses can also be produced. Typical applications would include sequential starting of electric motors; typical impulse applications might involve operation with solenoid valves, air cylinders, etc.

**Features:** Overall time delay of relay is adjustable from 0.1 second to 10 minutes or more. First circuit switch can be adjusted to operate at any time from 0 to 15 seconds after start of overall period.

**Description:** Compact time-delay relays are light-weight and feature adjustability of both control periods. Adjustable delay is accomplished by means of pneumatic damping. In operation, time delay period begins immediately with energization of solenoid. After first adjusted interval, auxiliary switch operates. At end of overall time main relay switch operates. Both switches hold until coil is de-energized. Their return to initial position is immediate.

A second set of relays is available where both switches operate when solenoid is energized, but delay is incurred in breaking circuits when power is removed from solenoid coil. Switch arrangements are SPDTDB and DPDTSB. Switch rating is 15 amp at 115 v, auxiliary switch rated at 10 amp, 115 v.

(NET Agastat Delay Relays are manufactured by A/G'A Div., Elastic Stop Nut Corp. of America, Dept. CP, 1027 Newark Ave., Elizabeth, N. J. . . . or for more information check CP 8284 on handy form, pages 2 and 3.)

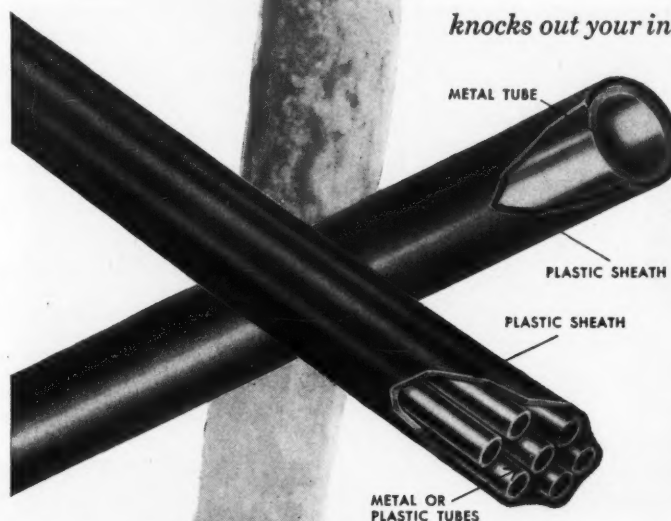
### Spec sheet on thermocouples and extension wires issued

Thermocouples and extension wires — their sizes, accuracies, chemical compositions, and weights — are listed and described in 6-page specification sheet.

Spec Sheet 307 is available from Minneapolis-Honeywell Regulator Co., Dept. CP, Station 64, Wayne and Windrim Ave., Philadelphia 44, Pa. Specify CP 8285 on handy form, pages 2 and 3.

# DEKORON INSTRUMENT TUBING

*knocks out your instrument line corrosion problems*



**DEKORON** single-line tubing. Samuel Moore & Co. will coat your copper, aluminum or steel tubing by the Dekoron extrusion process, or will supply coated tubing. Straight lengths to 20 ft., coils to 1000 ft.

**DEKORON IMPERVAPAK** is a multiple tube harness of plastic or metal tubes encased in tight plastic sheath. Multiple tube construction cuts down installation costs.

Corrosion endangers the life line of your plant—your instrument tubing. That's why you should investigate Dekoron instrument tubing, the tubing that's impervious to moisture, salt air, corrosive atmospheres, and chemicals.

That means Dekoron eliminates replacement costs and maintenance. Other advantages are low initial cost . . . less plant down time . . . easy installation with standard fittings and plastic tape.

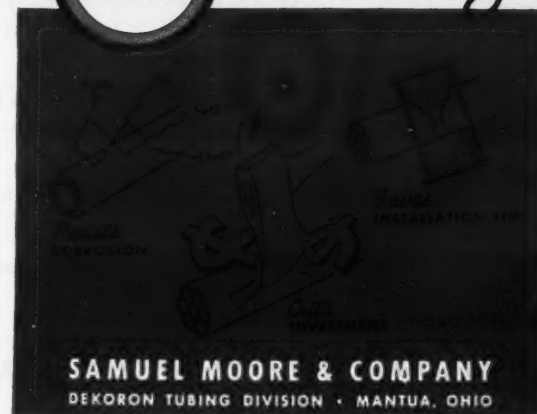
In replacement savings alone—not including lower maintenance and installation costs—Dekoron Instrument Tubing pays for itself over and over again.

A-7834



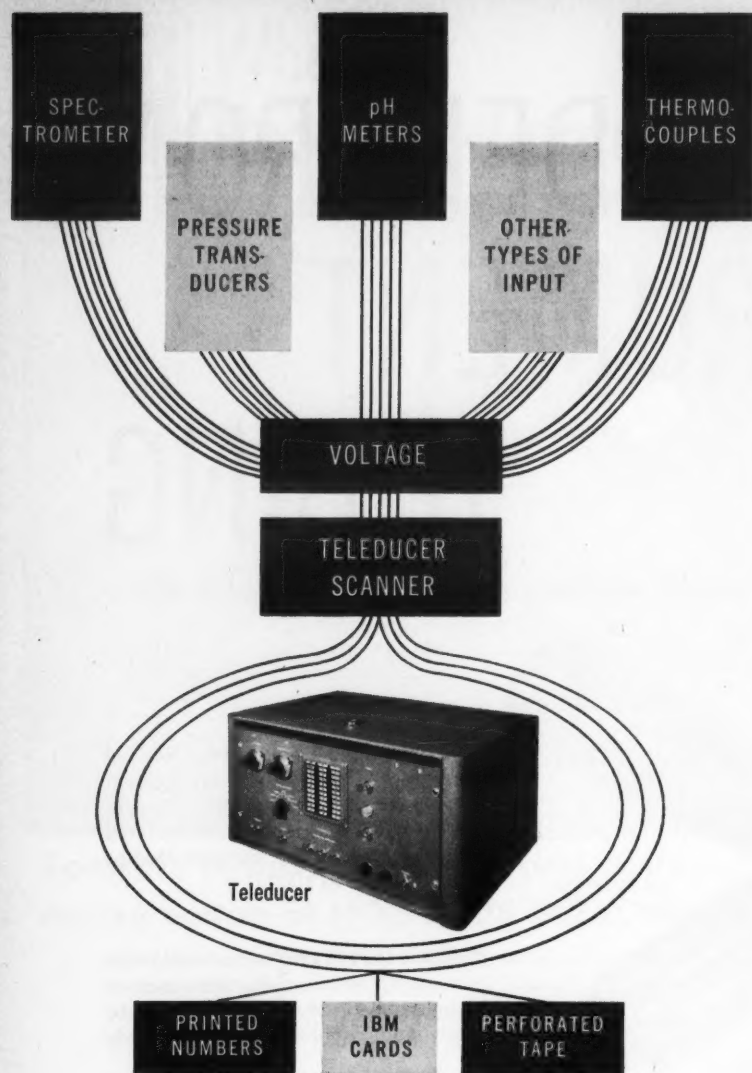
Send for free copy of Bulletin L-6506  
"3 Ways to Whip Corrosion and High  
Tubing Installation Costs in Your Plant."

**Dekoron**® tubing



When inquiring check CP 8286 on handy form, pgs. 2-3





## Automatic scanner and digital recorder...

The new Teleducator Scanning System eliminates high labor costs and human errors from scanning and recording. It gives you accuracy of 0.1%, speeds as fast as one recording operation per second, and readout in decimal numbers.

One Teleducator Scanning System handles from one to 100 channels of input from various sources, reads out in printed numbers, punched cards or perforated tape.

Scanning and recording can be continuous or intermittent, depending on your need.

Specifications will be sent you upon request. Please address inquiries to Preston W. Simms, Dept. CP-5.

## TELECOMPUTING CORPORATION

BURBANK, CALIFORNIA • Washington, D. C.

When inquiring check CP 8287 on handy form, pgs. 2-3

## INSTRUMENTATION

### Describes and illustrates flow signal transmitters

Combination 1500-psi liquid line-flow measuring element and pneumatic flow-signal transmitter is illustrated and described in four-page bulletin. Design features covered include: advantages obtained by using integrally-constructed measuring orifice with differential-pressure bellows; simplicity of checking instrument by dead weight calibration; accuracy of more than 1% of full-scale reading, and sizes of measuring elements up to 2000 gph.

Bul 2653 is issued by Hagan Corp, Dept. CP, P.O. Box 1346, Pittsburgh, Pa. When inquiring specify CP 8288 on handy form, pages 2 and 3.

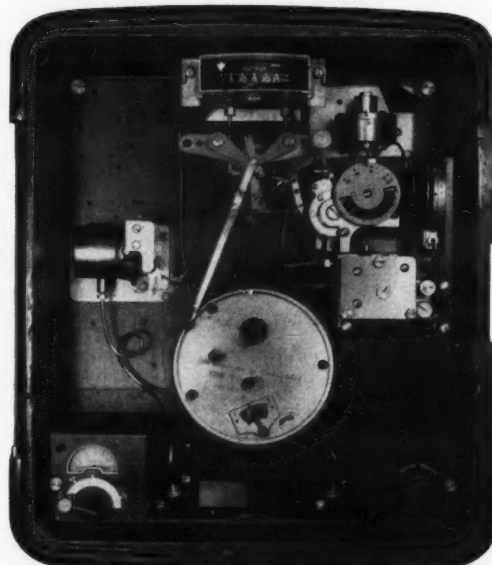
### No danger of overshooting though warm-up period is minimum...

modified batch controller has automatic reset function — refuses to get "wound up"

**Uses:** Especially designed for control of temperature or other variables in batch processes such as rubber reactors, plastics polymerizers, and oil cooking kettles which are operated on a non-continuous basis.

**Features:** Batch controller is designed to prevent overshoot of a variable during startup of batch process. It can, for example, bring process up to operating temperatures safely.

**Description:** Batch mechanism has been added to standard controller and can be added to controllers already in service. Mechanism consists of



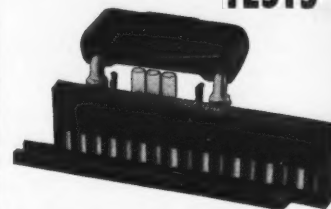
Open controller shows batch mechanism which replaces normal reset system during startup (arrow, upper right)

"couldn't do without my



## TAYLOR COMPARATOR

for pH, CHLORINE TESTS"



That's what chemists and engineers say in plants all over the country... because Taylor Comparators give you fast, easy determinations of pH, chlorine, phosphate, as well as complete water analysis. And you can make these determinations anywhere in the plant! No need to carry solution samples back to the lab since your Taylor set is lightweight, small, and no trouble at all to carry with you.

### ACCURATE

There's no chance of mechanical inaccuracy because all Taylor Liquid Color Standards carry an unlimited guarantee against fading!

### EASY TO USE

Taylor Comparators use the familiar colorimetric method of comparison, but without the need for fragile, single Nessler tubes. All color standards for a single determination are housed in a sturdy plastic slide. Many different slides may be used on the same base.

**GET THE FULL STORY** from your lab supply dealer or write for free book, "Modern pH and Chlorine Control". Gives theory and application of pH and Chlorine control, illustrates and describes full line of Taylor Comparators.



**W. A. TAYLOR AND CO.**

YORK & RODGERS FORGE RD. • BALTIMORE, MD.

When inquiring check CP 8289 on handy form, pgs. 2-3

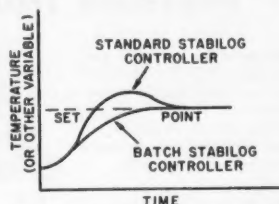
CHEMICAL PROCESSING

## INSTRUMENTATION

3-way switch which is tripped by output pressure of the controller. When process is being shut down and measured variable drops below proportional band, switch cuts in to vent reset system and reverse action of reset bellows. This lowers proportional band so that when process is started again throttling action starts sooner than normal. As soon as measurement enters proportional band, switch is cut out and normal control action takes over.

Instead of undesirable "wind-up" which automatic reset ordinarily produces during periods of shut-down, batch switch reduces delay in initial control response and prevents overshoot in control point.

(Batch Stabilog® Controller is a development of The Foxboro Co., Dept. CP, 86 Neponset Ave., Foxboro, Mass. . . . check CP 8290, pages 2 and 3.)



Comparison of startup with standard and batch controller

### Facelifting makes flowmeter suitable for mounting on panel . . .

tilting U-tube instrument good for pressures to 1000 psi and produces linear reading and signal

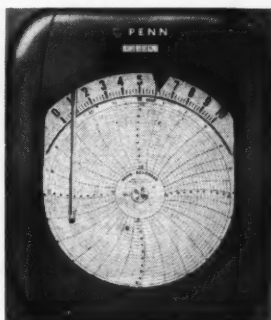
**Uses:** Instrument records flow of fluids with signal from differential pressure device.

**Features:** Redesigned case makes the tilting U-tube unit usable as a panel-mounted recorder. Operating mechanism remains unchanged.

**Description:** Tilting U-tube principle makes use of torsion tubes. Design eliminates springs, bellows, stuffing boxes, and pressure-tight bearings. Record is made on linear paper and a linear pneumatic signal is available at the instrument. Square root correction is made by cam.

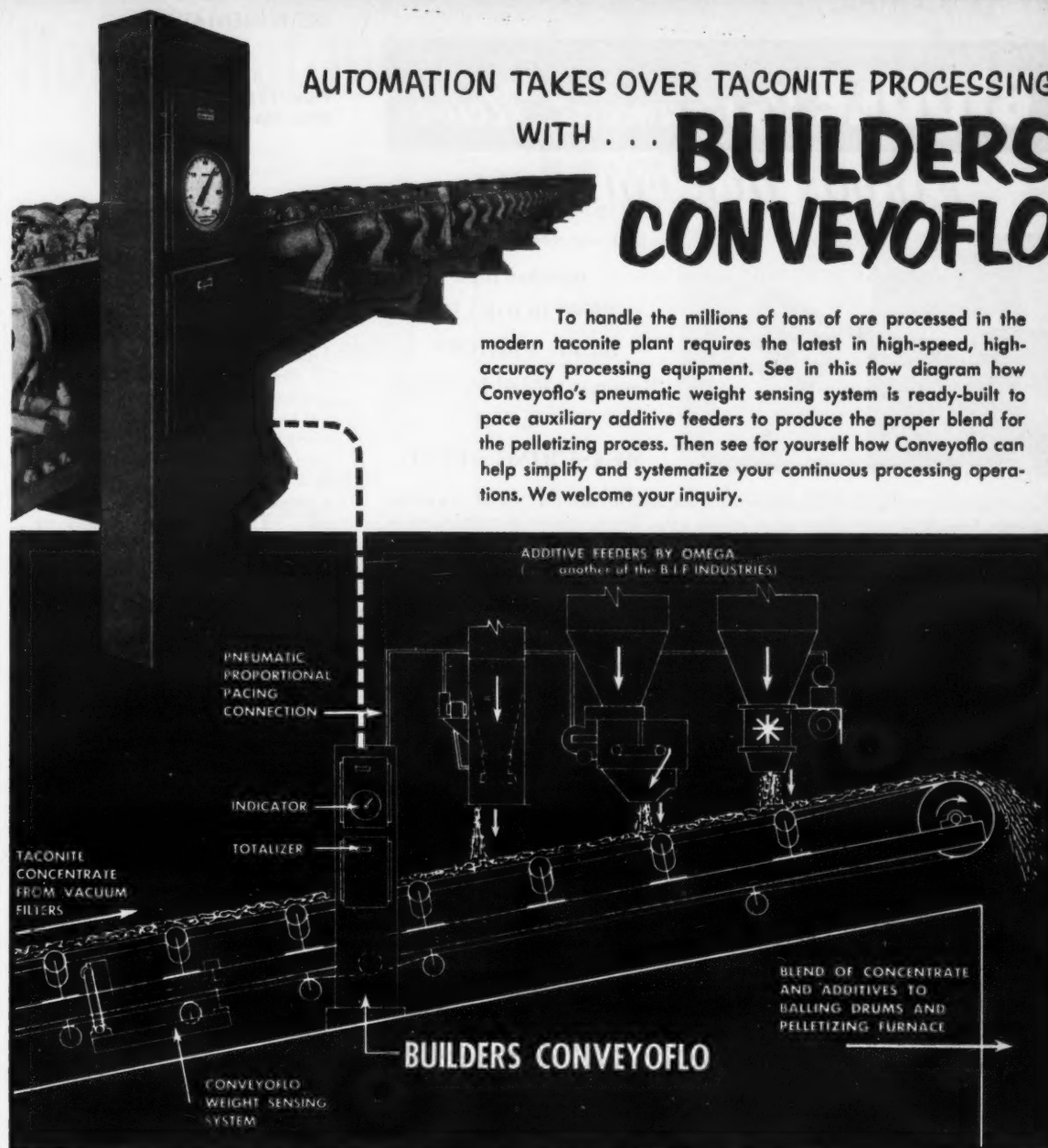
Calibration of instrument is quickly and accurately checked without disturbing pipe connections. Differential range may be alternated at any time by changing cam weight. Case of the instrument is made of pressed steel, is moisture-proof. Welded steel manometers are suitable for pressures to 1000 pounds per sq in.

(Tilting U-tube flowmeter is manufactured by Penn Industrial Instrument Corp., Dept. CP, 4110 Haverford Ave., Philadelphia 4, Pa. . . . or for more information check CP 8291, pages 2 and 3.)



## AUTOMATION TAKES OVER TACONITE PROCESSING WITH . . . BUILDERS CONVEYOFLO

To handle the millions of tons of ore processed in the modern taconite plant requires the latest in high-speed, high-accuracy processing equipment. See in this flow diagram how Conveyoflo's pneumatic weight sensing system is ready-built to pace auxiliary additive feeders to produce the proper blend for the pelletizing process. Then see for yourself how Conveyoflo can help simplify and systematize your continuous processing operations. We welcome your inquiry.



### CONVEYOFLO FEATURES

- **ACCURATE . . .** within  $\pm 1/2$  of 1% of actual weight from maximum to 50% of rated capacity; within 1% from 50% to 25% rate; within 2% from 25% to 10% of meter's rated capacity.
- **COMPACT . . .** weight sensing mechanism completely contained within conveyor structure. No overhead levers. Panel stand only 9" x 18" — may be any height.
- **AUTOMATIC TOTALIZER COMPENSATION** for variations in belt speed and changes in belt weight.
- **RESPONDS ACCURATELY** to rapid load variations.
- **PACES AUXILIARY EQUIPMENT** (feeders, controllers, continuous blending processes, etc.) and operates secondary totalizers, indicators, recorders.



## BUILDERS-PROVIDENCE

DIVISION OF B-I-F INDUSTRIES, INC.

Builders-Providence, Inc.  
357 Harris Ave., Providence 1, R. I.

Please send Bulletin 550-H4A describing Builders Conveyoflo Meter.

Name

Company

Street

City  State

When inquiring check CP 8292 on handy form, pgs. 2-3



# BIDDLE Instrument News

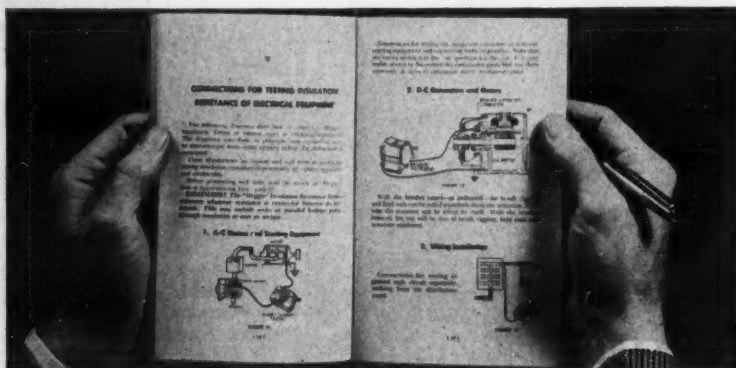
## PARDON OUR POINTING...



but we don't want you  
to miss this  
**NEW BOOKLET**  
on the **FRAHM®**  
**Resonant Reed Principle**  
of  
**MEASURING SPEED**

Parts of the booklet are cut away to show you the simplicity of the inner "works" of a Frahm Resonant Reed Tachometer. There are no moving parts. Hence, little or no maintenance is required. Speed is measured by merely touching or mounting a Frahm Resonant Reed Tachometer to any part of the casing or chassis of motor or machine. This is an important safety feature because readings do not have to be made in dangerous locations; they may be made at any point that is most accessible and in the best light. The booklet graphically shows you how speed is measured by resonance and read by noting the vibrations of scientifically tuned steel reeds on a scale calibrated in rpm. Many sizes, shapes and models of Frahm Resonant Reed Tachometers are offered by James G. Biddle Company covering speed ranges from as low as 900 to as high as 100,000 rpm. "Every maintenance man can use a Frahm."

Write for Booklet 31-P8-CP.



## MEGGER® MANUAL

Tells You How To Test **ELECTRICAL INSULATION**

40,000 Copies Have Been Distributed

This 94 page manual is in demand by educators as well as practical electrical men. It covers subjects of necessity to anyone who is responsible for electrical equipment.

"Why Test Insulation Resistance?"  
"Preparation of Apparatus for Test"  
"Tests When Drying Out Wet Apparatus"  
"Temperature Correction"  
"Methods and Interpretation"

These are but a few of the 14 chapters that are built around the subject of testing electrical insulation resistance . . . and, of course, effective use of the Megger® Electrical Insulation Resistance Tester sold in the U. S. only by the James G. Biddle Co. Supply is limited. Please write on your company letterhead for **INSTRUCTION MANUAL 21-J-CP.**

B-403

## JAMES G. BIDDLE CO.

ELECTRICAL TESTING INSTRUMENTS  
SPEED MEASURING INSTRUMENTS  
LABORATORY & SCIENTIFIC EQUIPMENT

1316 ARCH STREET  
PHILADELPHIA 7, PA.

When inquiring check CP 8293 on handy form, pgs. 2-3

## INSTRUMENTATION

### Flow regulator screws into pipeline . . .

operated entirely by liquid passing through it

**Uses:** For regulating flow rates to preset values.

**Features:** Unit requires no outside source of energy, is operated entirely by the liquid which is passing through it.

**Description:** The 1/2, 1, and 2" sizes in which unit is available can handle flow ranges of 0.5 to 5, 1.0 to 15, and 6 to 80 gpm respectively. Reproducibility of flow rates with a given dial setting is said to be as good as  $\pm 3\%$  over a pressure drop range of 5 to 125 psi. The controller operates by sensing differential pressure. Designed to operate at a pressure loss across valve of 5 psi, unit can be adapted to low-pressure-drop service by removing one of its two springs.

(Flow regulators are a product of Fischer & Porter Co., Dept. CP, Hatboro, Pa. . . or for more information check CP 8294 on handy form, pages 2 and 3.)

### Sheds light on metal hardness testing machines

**Uses:** For checking hardness of ferrous and non-ferrous metals when used in conjunction with a Brinell metal hardness testing machine.

**Features:** Device can also be used wherever a microscope is needed to make measurements up to 7.0 mm.

**Description:** Made to measure diameters of indentations made by ball indentors of hardness testing machines, unit gives magnification of 20 diameters. Microscope features reticle in a flat-field optical system and self-enclosed beam of light. It provides clear image of indentation with sharp image of reticle superimposed. Scale is calibrated in millimeters and tenths of millimeters. Total length of scale is 7.0 mm.

(Microscope-Reader is a product of Pacific Transducer Corp., Dept. CP, 11921 W. Pico Blvd., Los Angeles, Calif. . . or for more information check CP 8295 on handy form, pages 2 and 3.)

## SHORT RANGE SPANS, HIGHLY SENSITIVE

### The Taylor TRANSAIRE® Pressure Transmitter!

**Designed** to measure and transmit pressure changes up to 1,000 ft., it is accurate to 1/2% of the selected short range span and sensitive to pressure changes of 1/2" water.

• **Short range spans** available 20 to 40 psi, throughout range limit of 35 to 415 psia, and 50 to 100 psi, throughout 100 to 1,000 psia.

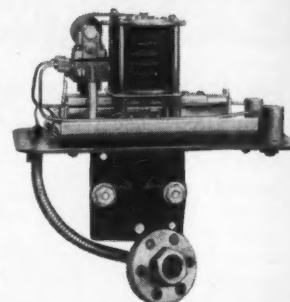
• **Suppressed ranges** throughout pressure limits.

• **Volumetric type pressure system** is extremely accurate, practically clog-proof, has corrosion resistant 316 stainless steel diaphragm.

• **Temperature and barometric compensation** for higher accuracy of measurement and control.

**Ask your Taylor Field Engineer**, or write for **Bulletin 98097**, Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

\*Reg. U. S. Pat. Off.

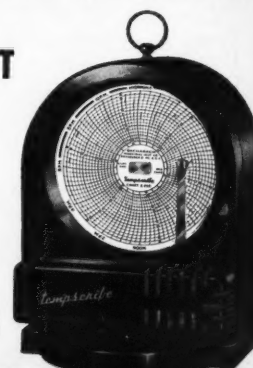


### TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

When inquiring check CP 8296 on handy form, pgs. 2-3

## For Accurate TEMPERATURE RECORDS at MODERATE COST

RANGES AVAILABLE	
Temperature Range	One Rotation of Chart
-30° to +120°F	7 Days
-30° to +120°F	24 Hours
-20° to +40°F	24 Hours
-20° to +40°F	7 Days
-10° to +50°F	24 Hours
-10° to +50°F	24 Hours
30° to 60°F	7 Days
30° to 60°F	24 Hours
40° to 100°F	24 Hours
60° to 90°F	8 Hours
60° to 90°F	24 Hours
70° to 130°F	8 Hours
70° to 130°F	4 Hours
100° to 160°F	24 Hours
100° to 160°F	24 Hours
-25° to +10°C	24 Hours
5° to 40°C	24 Hours



## Use TEMPSCRIBE Recorders

The TEMPSCRIBE self-registering Recording Thermometer meets a long-felt need for a moderately priced recorder for general purpose applications where a graphic record of temperature in surrounding air is required. The record—written on an easy-to-read chart, 4" in diameter, with graduations spaced uniformly over full range—is indispensable wherever knowledge is desired if temperature goes above or below any given point. TEMPSCRIBE is the only recorder made with pen and actuating element in door, which, when opened, permits a clear view of the complete chart, and easy chart replacement without danger of damaging pen arm or accidentally marking chart.

Write for Bulletin 704

**BACHARACH INDUSTRIAL INSTRUMENT CO.**  
7301 Penn Avenue • Pittsburgh 8, Pa.

When inquiring check CP 8297 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Output signal is proportional to actual flow of heat . . .**

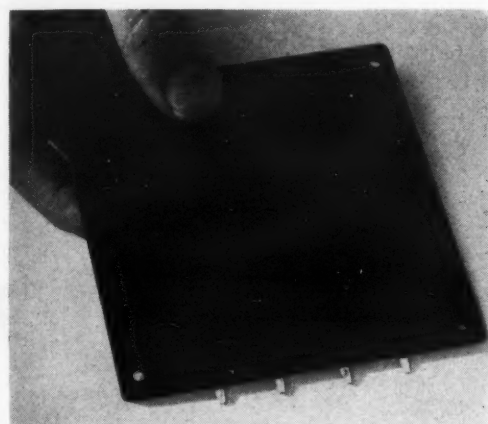
sensitivities range up to 6 Btu/sq ft/hr/mv for direct drive of indicators and controllers

**Uses:** Sensing element is capable of detecting actual flow of heat in Btu/sq ft/hr. Size of element is only  $3/64 \times 4\frac{1}{2}$ " square.

**Features:** Use of 180 to 720 thermocouple junctions provide sufficient voltage for direct drive of indicating or recording instruments.

**Description:** Silver-constantan thermocouple junctions are used in heat-flow transducer. High electrical output is linear with temperature gradient across transducer. Various physical and electrical variations of transducer are available for special requirements.

In addition to the 180 x 720 "gradient" junctions, transducer contains a thermocouple for checking ambient temperature. Sensitivities range to as



180 to 720 thermocouple junctions used in measuring temperature gradient

high as 6 Btu/sq ft/hr/mv. Each transducer weighs approximately one ounce and has all terminals along one edge.

(Mod 200 Heat-Flow Transducer is a product of Beckman & Whitley, Inc., Dept. CP, 960 San Carlos Ave., San Carlos, Calif. . . or for more information check CP 8298 on handy form, pages two and three.)

**Folder describes pilot valves controlled by solenoid**

Six-page folder describes  $1/4$ " direct-operated, 4-way valves controlled by solenoid. Three basic types are available: single solenoid with spring offset spool, double solenoid without spring, and a double solenoid with spring centered spool.

Bul 25 is issued by Pantex Manufacturing Corp., Dept. CP, Pawtucket, R. I. When inquiring specify CP 8299 on handy form, pages 2 and 3.

# How to get more out of process steam

**... to improve product quality, reduce production costs, eliminate bottlenecks**

Make sure the steam traps and temperature controls on your process equipment have been properly specified and installed.

Here's why! Very often when production schedules are upset and steam costs seem relatively high, you'll find the trouble is not with the process equipment . . . *but with the way steam is used!*

## Avoid These Production Headaches

The wrong type of trap can cause waterlogging and keep equipment from reaching and maintaining proper temperatures. Result: production slow-downs and waste of steam. Air film caused by inadequate venting drastically reduces heat transfer and prolongs processing time. Erratic temperature control is often the cause of rejects or product spoilage and further raises production costs.

## Call In Sarco

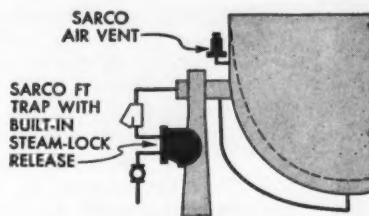
Plant after plant has benefited from Sarco's experience in the process industries. Backed by a complete line of steam traps and temperature controls, Sarco engineers are able to offer you impartial, expert recommendations on how to get more out of process steam.

For case histories describing how other plants in your field solved similar problems, write today to Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

# SARCO

*improves product quality and output*

2050-C



This Sarco steam trap and air vent hook-up on steam-jacketed kettle assures quick heat-up and even temperature throughout cooking cycle.

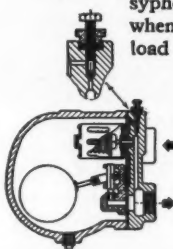
## Taking The "Guess" Out Of Kettle Cooking

**Problem:** To eliminate prolonged cooking time and variations in cooking cycles in steam jacketed kettles.

**Solution:** Insure consistent and maximum heat transfer by getting rid of:

**Air Pockets and Films**—Install a Sarco Thermostatic Air Vent in the *right* place to eliminate these heat robbers. Sarco Air Vents discharge air, gases and air-steam mixtures, often  $20^{\circ}\text{F.}$  below steam temperatures. Self-adjusting bellows opens vent at slightly below steam temperature.

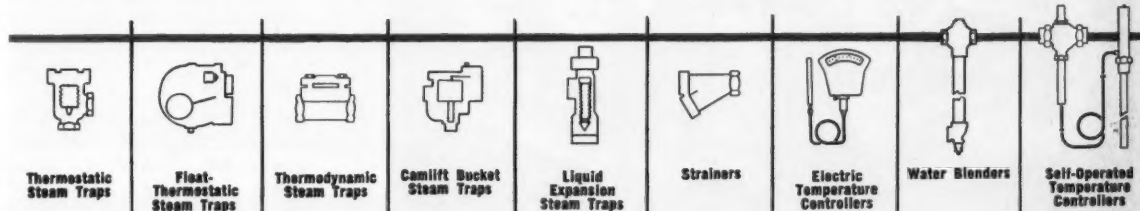
**Waterlogging**—Install a Sarco Float-Thermostatic Steam Trap with a built-in *steam lock release valve*. Waterlogging causes low and uneven heat transfer. It occurs when condensate discharge is blocked by steam in syphon pipe; it also occurs when trap can't handle wide load variations.



The float operation of this trap enables it to handle wide variations of load and steam pressure. The steam-lock release valve prevents waterlogging, by completely eliminating steam-locks in the syphon pipe.

For complete information on Sarco Air Vents and Traps with integral steam-lock releases, write for literature.

## STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS



When inquiring check CP 8300 on handy form, pgs. 2-3

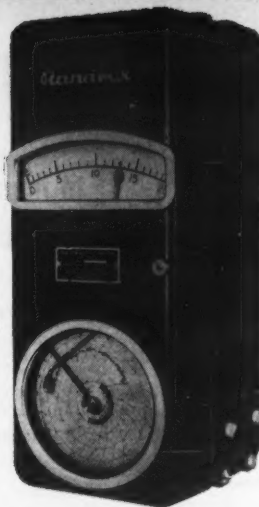


**FOR  
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**Indicates, Records, Controls**

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High Accuracy  
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The Permutit Company, Dept. CP-5  
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When inquiring check CP 8301 on handy form, pgs. 2-3

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PRODUCTION**

**BOWSER**  
ESTABLISHED 1885

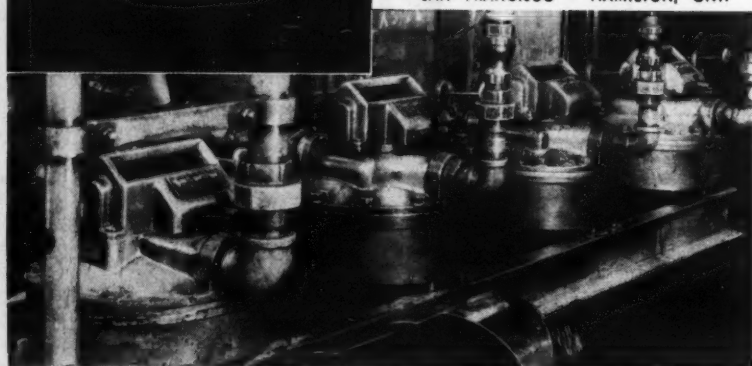
### ... MODERNIZE YOUR LIQUID HANDLING METHODS NOW

Install Bowser XACTO, the meter that's changing chemical processing habits. Wherever accurate measurement is essential to assure product uniformity... XACTO will do the job.

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When inquiring check CP 8302 on handy form, pgs. 2-3

## INSTRUMENTATION

### Condensed catalog of Instruments

Four-page, two-color catalog lists manufacturer's line of control instruments. Illustrated are recorders, controllers, indicators, combustion safeguards, and control accessories.

"Condensed Catalog" of control instruments is issued by Wheelco Div., Barber-Colman Co., Dept. CP, Rockford, Ill. When inquiring specify CP 8303 on handy form, pages 2 and 3.

### Keeps tab on fluid rate of flow...

interchangeable tubes permit wide ranges to be covered



Uses: For rate-of-flow measurements of liquids and gases.

Features: Construction permits use of up to four sizes of meter tubes in one meter case.

Description: Unit can be adapted for electric or pneumatic transmission and remote recording of fluid rate of flow. Enclosed

steel meter case with detachable safety glass windows offers protection from internal shock. Scales are available calibrated either in units of flow, or in millimeters for use with calibration charts.

(Safeguard Rotometer is a product of Schutte and Koerting Co., Dept. CP, Cornwells Heights, Bucks County, Pa. ... check CP 8304 on handy form, pages 2 and 3.)

### Folder gives features of portable scales

Printed in three colors, four-page folder illustrates portable scales in both full height and bench height models. Scales have capacities from 125 to 2000 lb for a wide variety of industrial uses.

Form 2004 is issued by Toledo Scale Co., Dept. CP, 1009 Telegraph Rd., Toledo 1, Ohio. When inquiring specify CP 8305 on handy form, pages 2 and 3.

## FOR TESTING FABRICS THAT MUST HOLD GAS



The Cambridge Fabric Permeameter is an accurate, rugged and convenient instrument for production testing of the permeability of fabrics which are to be inflated with Hydrogen, Helium, Carbon Dioxide, etc.

The rate of permeation through the fabric is quickly determined by equipment utilizing the thermal conductivity method and is indicated in terms of liters per square meter per 24 hours of the retained gas.

Manufacturers of fabrics for lighter-than-air Craft, Lift Rafts, Life Jackets, Gas Masks, etc., will find this an indispensable instrument. Send for particulars.

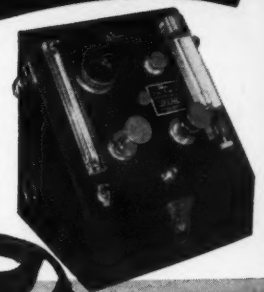
**CAMBRIDGE INSTRUMENT CO., INC.**  
3706 Grand Central Terminal, New York, N. Y.

## CAMBRIDGE FABRIC PERMEAMETER

When inquiring check CP 8306 on handy form, pgs. 2-3

**FASTER... EASIER**

## PRECISION DEW POINT INDICATOR



★ The Alnor is the only dew point indicator that is a complete unit in itself... it is readily portable and does not require external coolants or auxiliary apparatus.

★ Controlled testing conditions are assured. Indications take place in an enclosed chamber... dew or fog is observed suspended in air—not on a polished surface. This means greater accuracy, faster reading—every time.

★ Simple, direct operation of the Alnor Dewpointer assures laboratory accuracy by non-technical personnel. Substantial carrying case protects it against the usual hazards of portable use.

★ Available in three ranges—for dew points between minus 20 deg. F. and room temperatures, from minus 80 deg. F. to 0 deg. F., and from -80 deg. F. to room temperature.

Write for Descriptive Bulletin. Illinois Testing Laboratories, Room 504, 420 N. La Salle St., Chicago 10, Ill.

**Alnor**

**PRECISION INSTRUMENTS  
FOR EVERY INDUSTRY**

When inquiring check CP 8307 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## INSTRUMENTATION

### Multi-point records produced on round-chart instrument

Round-chart recorders for 8 hours, 24 hours, or 7 days per cycle are being used in multi-point recording instrument. Both 6 and 24-point recorders are built.

Record printing is accomplished by means of novel rotating 6-point turret pen providing 6 different colored traces. Full print cycle for 6 points in standard unit is accomplished in 30 seconds. In 24-point models, 6-point printing is combined with segmental recording — circular chart is divided into 4 quadrants each equivalent to the cycle period for chart. Twenty-four-point cycle is accomplished in standard units in 2 minutes. On-off control can be provided on all points.

Special feature of recorder is that when cycling mechanism is switched off, recorder operates as



Up to 24 points and 7-day continuous record. Rotating turret pen (arrow) prints in six colors

normal single-point recorder. Sensing elements employed with recorder include resistance bulbs for temperature, strain gages, linear differential transformers, conductivity cells, and others. Both electric and pneumatic control are available.

(Multi-point Round Chart Recorders are products of Fielden Instrument Div., Robertshaw-Fulton Controls Co., Dept. CP, 2920 N. Fourth St., Philadelphia 33, Pa. . . or for more information check CP 8308 on handy form, pages 2 and 3.)

### Tells uses for hand pyrometer

Four-page, two-color booklet gives data on features and applications of portable hand pyrometer. Instrument measures temp of any surface, liquid, gas, or molten metal from 0 to 1500°F. Illustrations emphasize applications.

Bul GEA-6020 is issued by General Electric Co. Specify CP 8309 on handy form, pages 2 and 3.

## argus CAMERAS, INC., ANN ARBOR, MICH.

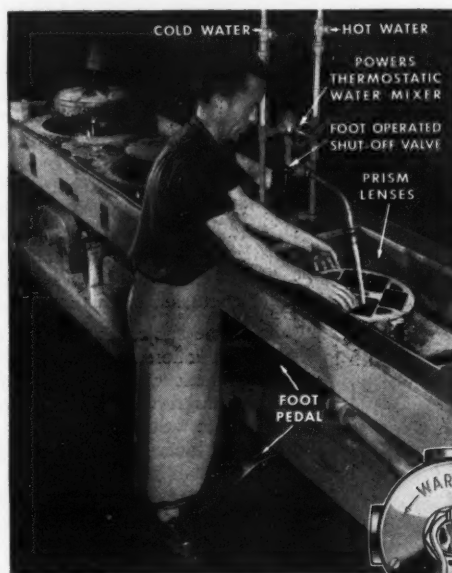


### FAMOUS ARGUS C3 35 MM CAMERA

Precision Lenses for this and other Argus cameras, and projectors and optical components for complex optical instruments used in our nation's defense — are produced in Argus' modern optical plant.

## focused on **POWERS** Temperature Control

—for better regulation of washing polished lens blocks



Worth an extra pair of hands

### HERE ARE THE RESULTS

Combination of a POWERS Type H Thermo-Static Water Mixer and a Bradley foot operated shut-off valve release both of worker's hands for lens washing. Instant shut off prevents waste of water. Accurate control of water temperature prevents damage to lens.



75 Powers Thermo-Static Water Mixers are used in Argus' large completely modern optical plant. Row upon row of machines like those shown here polish lenses and prisms to a high degree of accuracy.



## POWERS Control Saves Labor and Hot Water . . . Also Helps Prevent Damage to Lenses

Accurate temperature control of water used in washing lens blocks is very important. The double safety of a Powers thermostatic water mixer shown at left insures the most accurate control obtainable.

It automatically mixes hot and cold water and delivers a mixture at any temperature desired regardless of **pressure** or **temperature** changes in water supply lines. Failure of cold water instantly shuts off the delivery. Users often report accuracy of  $\pm \frac{1}{2}^{\circ}$  F. Capacity 2 to 10 gpm @ 45 psi. Write for Bulletin 365. Larger Capacity Water Mixers available up to 1200 gpm @ 45 psi. Write for Catalog WC.

**Check Your Control Problem with an Experienced POWERS Engineer.** He will help you select the proper type of control for your requirements. Contact our nearest office or write us direct.

(b68)

Established in 1891 • **THE POWERS REGULATOR COMPANY** • SKOKIE, ILL. • Offices in Over 50 Cities

When inquiring check CP 8310 on handy form, pgs. 2-3

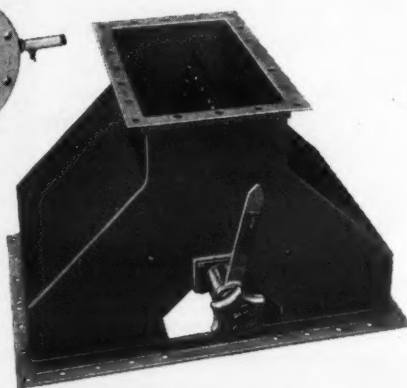


# Instant Response Tight Shut-off

with...  
**W. S. ROCKWELL**  
**Butterfly**  
**VALVES**



8" butterfly valve designed to carry hydrocarbon vapors at 100° F. and 20 p.s.i., seals bubble-tight by means of special high pressure plastic sealing lubricant injected through the hollow valve blade into 2 annular rings in blade which contacts the valve body. Closure is controlled by an air diaphragm operator and valve positioner.



Special fabricated stainless steel, 3-way diverter valve fitted with Neoprene seals to insure tight closure; for handling crystalline materials; manually operated by position-indicating lever handle.

Rockwell Butterfly Valves are made of any required metal or rubber-lined for minimum pressure drop, uniform, quick control and positive shut-off—commercial, drip or air-tight. Sizes to 132"; pressures to 900 p.s.i.; temperatures to 2000° F., in standard and special types. Catalog on request.



**W. S. ROCKWELL COMPANY**

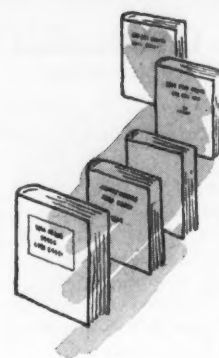
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## Recent Books



### Small Particle Statistics

Reviewed by R. P. LOVELAND  
Kodak Research Laboratories  
Eastman Kodak Company

The object of this book by G. Herdan of the University of Bristol is stated by the author to be "to establish the statistics of particles as a branch of statistics in its own right". M. L. Smith of Harwell contributed the last five chapters (Part V) on experimental methods and errors. The book is unique in that, with an important exception discussed later, it supplies a reasonably complete discussion of this important field.

The whole subject is so huge and so complex that inherently the reader must attack a huge mass of detailed discussion. The author has a very systematic organization throughout. Still, a newcomer to this field must find himself, on first reading the book, overwhelmed in the complexity of detailed and extended discussions. Although the author's preface states that "no knowledge of statistics is assumed on the part of the reader and the mathematical functions are derived in a simple way," this reviewer feels that a reader without some prior knowledge of mathematical statistics would have considerable difficulty. Some lack of lucidity may be ascribed to an incompleteness of statement and development including the examples in the first of the book.

The functions of this book may be stated to be: (1) for the trained worker in the field, as a book to be read for new perspective and for information outside his particular routine; (2) for both novice and worker, as a reference work. It should prove very valuable for both purposes. For the second purpose its reasonably good index could be even better; its outlined table of contents is the more useful.

The principal tool for development and organization, and one that is both interesting and effective, is the study of inequalities, led off by Cauchy's theorem and applied to the various statistical averages to obtain

the various measures of dispersion of particle size.

There is a bibliography at the end of each chapter to complement the treatment in the book. There are omissions of even more pertinent material, probably inevitable with any one author even in a book claiming complete coverage. The most serious lapse noticed by this reviewer is the reference to the 1938 edition of the ASTM Tentative Standard for Analysis of Particle Size from which the definitions of the terms for "particle" are taken. This reference, which was really E20 of 1933, has been displaced by several in succession (the latest being E20-51T), and the definitions used from this source as "recommendations of the American Society of Testing Materials" have been altered.

The two chapters of Part IV are among the most interesting and unique of the book and it is probably important that the reader not get bogged down before reaching them. The theme, mentioned in the second paragraph is amplified and completed here. But most important is the excellent discussion of the importance and uniqueness in statistics of the use of samples by weight in particle size analysis and its effect in mathematical statistics. The author points out that such a sample of particles by weight (of  $n$  units) will normally contain a much larger value of  $n$  than when treated by number statistics (via microscope). However precision will not increase directly as  $\sqrt{n}$  but as  $\sqrt{n^m}$  where  $m < 1$ .

A reader relying upon reasonably complete coverage of the subject by this book would have his perspective distorted or be most disappointed by the almost complete omission of the important subjects of precipitation and Ostwald ripening, although there is a complete chapter on the production of a particle dispersion and its modification. The various methods of comminution and aggregation are discussed in detail. The first two subjects are also practically omitted in the bibliography. The statement that "Normal (Gaussian) distributions are found chiefly as produced by chemical processes of con-

densation and precipitation", is certainly mistaken since ample evidence has shown these to be usually of the log normal form although frequently complex.

There are a number of typographical errors, although most of them would be at once obvious to the careful reader. Omissions of the identifying bars over some of the x's in the formulas of chapter 8 are the most serious, especially to one consulting this part only as a reference.

To obtain "Small Particle Statistics" remit \$12 direct to Elsevier Press, Inc., Dept. CP, 402 Lovett Blvd., Houston, Texas. When inquiring specify CP 8312 on handy form, pages two and three.

### Organic Syntheses Volume 33

Reviewed by ROBERT C. KRUG  
Associate Professor of Chemistry  
Virginia Polytechnic Institute

"Organic Syntheses Volume 33" (vi + 115 pages), edited by Charles C. Price, is an addition to the very useful series of volumes so familiar to the organic chemist. The present volume includes forty methods of preparation of organic compounds. There are preparations of interest to those in the field of thiophene chemistry, and several methods of preparation of aldehydes, ketones, and esters. Included in the latter group is diethyl 1,1-cyclobutanedicarboxylate. The preparation of this compound is similar to that published in "Organic Syntheses" 23, 16, (1943) and very closely related to the method published by Wibaut, et al (Recueil des travaux chimiques des Pays-Bas, 58, 360-1, 1939), who reported an average yield of 55 per cent over 25 runs. The yield of this ester reported in the present volume of "Organic Syntheses" is 53-55 per cent.

In the opinion of this reviewer the editor should risk departure from present policy and encourage the cross-indexing of the common and systematic names of compounds. For example, the preparation of creosol is given on pages 17-19; the systematic name of this compound is given on page 19, but this latter name (2-methoxy-p-cresol) is not in the index. Stearone (18-pentatriacontanone) could easily be cross-indexed. The usefulness of the volume would be greatly increased by such cross-indexing.

Some of the equations given in this volume are half-equations whereas others are full, balanced equations. Many students (advanced undergraduates and graduates) who use "Organic Syntheses" volumes would be aided by such full equations.

The authors have given able descriptions of

the methods and have in practically all cases cited a specific source of supply of the required organic chemicals.

This volume is a worthy addition to the series.

To obtain "Organic Syntheses Volume 33" remit \$3.50 direct to John Wiley & Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, New York. When inquiring specify CP 8313 on handy form, pages two and three.

### Methods For Emission Spectrochemical Analysis

Reviewed by A. L. COURTNEY  
Wyandotte Chemicals Corporation

This book is primarily a collection of articles on suggested laboratory practices and spectrochemical methods of analysis submitted by various cooperating individuals to the ASTM Committee E-2 on Emission Spectroscopy. Included also are a report on suggested nomenclature, three tentative ASTM spectrochemical methods, and one tentative ASTM flame photometric method.

The content comprises General Practices, Nomenclature, Spectrochemical Analysis of Metals, and Spectrochemical Analysis of Nonmetals, the latter two constituting 80 per cent of the entire volume. Analytical methods are all presented in the same manner, each subdivided into (1) scope, (2) outline of method, (3) apparatus, (4) procedure, (5) precision, (6) accuracy, (7) discussion. Graphs and figures are all easily readable and the overall physical quality of the book is very good. Two appendices and a subject index are included.

The compilation, an outgrowth of a current program leading toward the standardization of spectrochemical methods and practices, is essentially a reference book for the industrial spectrochemist. In presenting more than fifty methods actually employed by practicing spectrochemists, Committee E-2 has amassed considerable information pertinent to applied spectroscopy. "Methods for Emission Spectrochemical Analysis" is highly recommended as a guide in the formulation of analytical procedures. However, because it purposely avoids theoretical treatment in general, it might prove of little value to those interested in other than the analytical aspects of spectroscopy.

To obtain "Methods for Emission Spectrochemical Analysis" remit \$5.15 for cloth-bound volume, or \$4.50 for paper-bound volume, direct to American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa. When inquiring specify CP 8314, pages 2 and 3.



## new stainless steel reinforced TEFLON IMPELLERS last 4 times longer

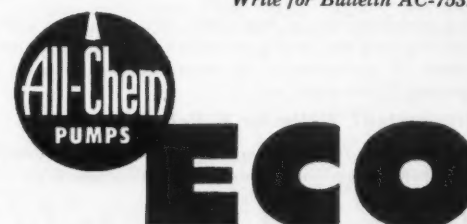
Down go chemical pumping costs—again. Now, the popular Eco All-Chem Pump has been further improved with stainless steel reinforced TEFLON impellers that permit pressures up to 150 lbs. if needed—and offer up to 4 times usual service life at normal 70 psi rating.

These impellers are now being offered on all new Eco All-Chem Pumps and are also available for and interchangeable with impellers of previous design, on pumps now in service.

### The Lowest Cost Pump in Pressure and Volume Range

- **Type Pump:** Positive displacement with two opposed axially oscillating impellers equivalent to duplex piston operation.
- **Volume:**  $\frac{1}{2}$  to 10 g.p.m. at 1750 RPM (water).
- **Suction Lift:** Highest over widest temperature and viscosity range.
- **Corrosion Resistance:** Lowest corrosion rate due to internal flow pattern.
- **Pump Operating Characteristics:** Linear delivery. No air entrainment. Non-foaming. Unequaled for safety in handling hazardous liquids such as nitric acid and hydrogen peroxide. Self-priming on non-volatile liquids.
- **Drive:** Applicable to direct motor drive at 1750 RPM, as well as to all other standard driving methods.

Write for Bulletin AC-753.



ENGINEERING COMPANY

12 New York Avenue • Newark 1 • New Jersey

When inquiring check CP 8315 on handy form, pgs. 2-3



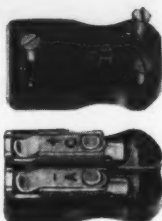
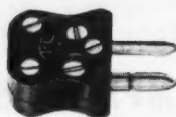


## WHY USE QUICK- COUPLING CONNECTORS FOR THERMOCOUPLE CIRCUITS?

**TO SAVE TIME!**

Frequent making and breaking of thermocouple circuits can take a lot of costly time. However, if you use T-E plug-and-jack connectors, a circuit can be made as quickly and easily as plugging in a radio.

Electrical contact is established through polarized elements which are made of thermocouple materials (your choice for use with Iron Constantan, Copper Constantan or Chromel Alumel Thermocouples). To maintain good electrical connection, the mated plug and jack provide both long-wiping surfaces and spring-loaded contacts. The connectors have screw-fastened, insulated covers, colored and marked to indicate calibrations.



PAT. PEND.

Interested? Write for Bulletin 23-R.

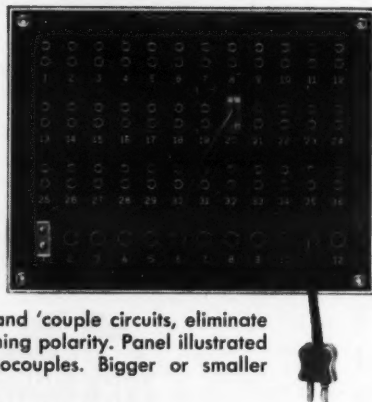


## WHY USE CONNECTOR PANELS FOR MULTIPLE THERMOCOUPLE CIRCUITS?

**TO SAVE TIME!**

By connecting all thermocouple circuits through central points, such as T-E's connector panels, you can save time in 2 ways.

(1) Check instruments or thermocouple circuits from one or more centrally located distribution panels. With plug-and-jack connectors, test instrument is easily and quickly tapped into any circuit. (2) Transfer multiple thermocouple circuits. The panel's quick-coupling connectors permit rapid making and breaking of instrument and 'couple circuits, eliminate splicing time and avoid mis-matching polarity. Panel illustrated takes 12 pyrometers, 36 thermocouples. Bigger or smaller panels, if you want 'em.



Interested? Write for Bulletin 23-R.

Pyrometers • Thermocouples • Protection Tubes • Quick-Coupling Connectors  
Thermocouple and Extension Wires • Resistance Bulbs • Connector Panels

# Thermo Electric Co., Inc.

SADDLE RIVER TOWNSHIP, ROCHELLE PARK POST OFFICE, NEW JERSEY  
IN CANADA—THERMO ELECTRIC (Canada) Ltd., BRAMPTON, ONTARIO

When inquiring check CP 8316 on handy form, pgs. 2-3

## for the laboratory



Incoming stock (shown here at tannery's loading dock) can gain or lose a lot of moisture depending on weather

## quick checks of moisture save oils, chrome for tanner

**Instrument allows mill weight to  
be based on hide substance  
rather than hide-plus-moisture**

**Problem:** Management at Colonial Tanning's Glove Leather Division in Milwaukee was not satisfied that unpredictable behavior of leather in process was unavoidable. Every tanner knows that packs treated identically do not make identical leather: some are undertanned, some refuse to take up oil, some won't color evenly. Colonial came to the conclusion that a key factor was the variable amount of water in the splits it was tanning. Skins with 10% moisture need more chrome and more oil per pound than skins with 40% moisture.

**Solution:** In order to get moisture figure in a hurry without elaborate facilities and drawn out lab work, they experimented with an infrared "moisture balance." This instrument takes a sample of leather in its single pan. Balance scale, calibrated directly in per cent moisture,



Self-contained infrared heat source makes moisture balance compact

CHEMICAL PROCESSING

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is adjusted before and after sample is placed to allow for original sample weight. Ordinarily, an infrared lamp is lowered into position over sample and operated until sample shows no further weight loss. Balance scale then shows per cent moisture with no further calculation.

This procedure works well with incoming hides (partially tanned, but not fatliquored). With leather that has been fatliquored there is a trick in using the balance — operator must recognize the period where all moisture has been driven out but oils have not started to volatilize. In practice this has proved fairly simple because of the relative involatility of the oils. Actually, Colonial has found no reason to tie up a technical man on moisture checking — mill operators themselves can use it to tell what moisture content their leather has.

**Results:** In the four months that Colonial has been using this instrument, it has already paid for itself. As well as aiding in making up mill loads based on *real weight*, the balance has been useful in estimating yields from lots of incoming splits and in avoiding drying problems.

(Moisture Balance is a development of Central Scientific Co., Dept. CP, 1700 W. Irving Park Rd., Chicago, Ill. . . . check CP 8317, pages 2 and 3.)

**Compact, line-operated meter gives direct readings of pH values . . .**

economically-designed instrument uses two tubes in stabilized, balanced circuit

**Uses:** For measuring pH of solutions from 0 to 14 with accuracy to 0.05 pH. Also usable for acid-base and "redox" titrations.

**Features:** Meter is simple to maintain. Balanced circuit uses two miniature tubes. One-stage amplifier, cathode-follower circuit is contained in replaceable plug-in units. Circuit is fully stabilized against voltage fluctuations within 95-130v range.

**Description:** Meter measures  $5\frac{1}{2} \times 7\frac{1}{2} \times 3''$  and weighs 3 lb. Scale is 4" with 140 divisions permitting readings to 0.05 pH. For acid-base and "redox" titrations, meter is graduated from +400 to -400 mv with zero-center setting of needle, and 0 to +800 mv and 0 to -800 mv with needle adjusted for zero at end of scale.

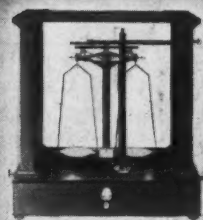
Polarizing plug-in adapter is available for "dead-stop" titrations. Unit operates at solution temperatures from 20 to 60° C or at higher temperatures with conversion tables.

Manual setting of auxiliary pointer marks reference point. Meter comes complete with shielded glass and calomel electrodes. Unit operates on 95-130v, 50-60 cy AC.

(Meter is a product of Photovolt Corp., Dept. CP, 95 Madison Ave., New York 16, N. Y. . . . check CP 8318 on handy form, pages 2 and 3.)

# Harshaw Scientific can DELIVER IMMEDIATELY any of these ANALYTICAL BALANCES

Choose yours today!



## AINSWORTH

H-1550—Type LC . . . . . \$177.00

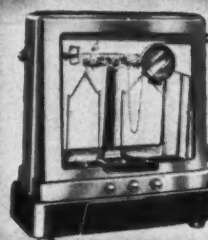
H-1560—Type LCB . . . . . 276.00  
(Capacity 200 gm., sensitivity 1/10 mg.)

H-1570—Type DL . . . . . \$254.00

H-1580—Type DLB . . . . . 353.00

H-1600—Type B . . . . . 285.00

\*H-1605—Type BB . . . . . 384.00  
(Capacity 200 gm., sensitivity 1/20 mg. H-1560, H-1580, H-1605 are equipped with chainweight and notched beam. Magnetic dampers extra at \$38.50 single end, \$60.50 double end.)



## CHRISTIAN BECKER

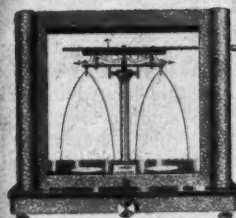
H-1803—Model AB-7 . . . . . \$177.00

H-1813—Model AB-4 . . . . . 353.00  
(Capacity 200 gm., sensitivity 1/10 mg., 1/20 mg. with loads up to 100 gm.)

\*H-1823—Model AB-2 . . . . . \$449.00

H-1813-10 Model AB-5 . . . . . 310.00  
(Capacity 200 gm., sensitivity 1/20 mg. H-1813, H-1823 are equipped with dial reading chainomatic, notched beam, magnetic damper. H-1813-10 is same, but without damper.)

H-1843—Model AB-1 . . . . . \$695.00  
(Projectomatic with notched beam. Direct reading 0 to 100 mg. No loose weights required up to 1.1 gm.)



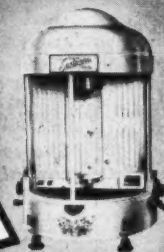
## VOLAND

\*H-2440—No. 100 . . . . . \$105.00  
(Ideal for student use. Aluminum cabinet. Single knob releases beam and pan simultaneously. Capacity 200 gm., sensitivity 1/10 mg.)

H-2440-30 . . . . . \$235.00  
(Same as H-2440 but equipped with notched beam, drum chain, equilibrium adjuster, and magnetic damper. No loose weights required up to 1.1 gm.)

H-2450—No. 200 . . . . . \$110.00  
(Similar to H-2440 but has a separate pan release.)

H-2450-30 . . . . . \$240.00  
(Similar to H-2440-30 but has a separate pan release.)



## SARTORIUS "SELECTA"

\*H-2424 Sartorius "Selecta" . . . . . \$890.00  
(Single pan; direct reading; no weight handling at all. Weights are placed on beam by merely rotating external knobs. Last 100 mg. projected on screen automatically.)

Harshaw Scientific stocks many other types of balances including micro, semi-micro, specific gravity, etc. We will welcome your request for literature or specific information.  
\*Illustrated

To avoid delay send Harshaw your order today!

**HARSHAW SCIENTIFIC**  
DIVISION OF THE HARSHAW CHEMICAL CO.  
CLEVELAND 6, OHIO

Cleveland 6, Ohio  
1945 East 97th St.  
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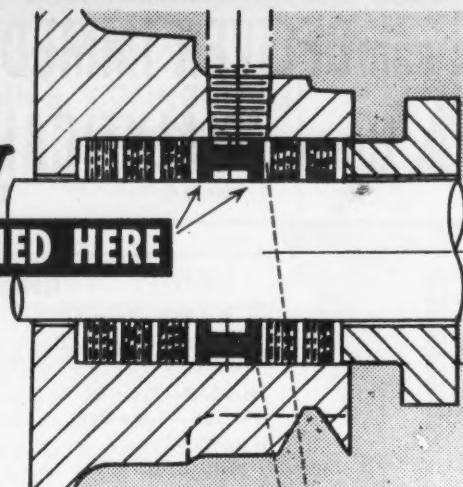
Houston 11, Texas  
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Jackson & Swanson Sts.

When inquiring check CP 8319 on handy form, pgs. 2-3



## THE LIFE OF YOUR PUMP SHAFT

IS DETERMINED HERE



## CHEMPRO TEFLON SEAL CAGES

for lubricating  
or cooling  
stuffing  
box packing



Flexible Chempro Seal Cages do not score the shaft as do two-piece metal lantern rings or other types of metal seals. They save the expense of replacing badly scored shafts in pumps and other processing equipment operating continuously at high speeds.

*Machined in a single piece*, Chempro Seal Cages snap easily over the shaft and *fit snugly*. No chance of movement or vibration even at very high shaft speeds. Their tough construction prevents bending or collapsing under extreme gland pressure.

For corrosive service, they are unbeatable — lasting many times longer than metal rings. They withstand continuous contact with acids, organic solvents, thionyl chloride, etc. — at normal and elevated temperatures.

Chempro Teflon Seal Cages are made in a wide range of sizes to fit most shaft diameters and stuffing box bores.

Write for complete Chempro Packing and Gasket Catalog.



**CHEMICAL & POWER PRODUCTS, INC.**  
The Original Fabricators of Teflon Packings and Gaskets

9 Broadway, New York 4, N. Y.

When inquiring check CP 8320 on handy form, pgs. 2-3

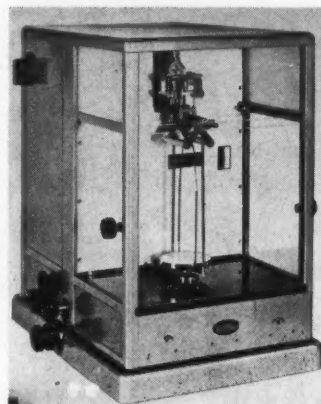
## LABORATORY

### Single pan balance reduces fatigue . . .

faster weighings are possible  
without sacrificing accuracy

Weight control knobs of balance are located at lower left side of instrument to permit operator to rest his elbows while selecting weights. Reading scale is located just above weighing pan.

Knife edges are made of optically ground sapphire to minimize frictional error and provide durability. To give lowest center of gravity



and reduce vibrations, all weights are located in enclosed base. According to manufacturer, weighing time averages less than 18 seconds. Reading scale, graduated from 0.10 mg to 200 grams, is at eye-level.

(Model S-M Balance is a product of E. Machlett & Son, Dept. CP, 220 E. 23rd St., New York 10, N. Y. . . or for more information check CP 8321 on handy form, pages 2 and 3.)

### Shows furniture for laboratory

Illustrated 24-page catalog shows all types of furniture, fittings, and furnishings for the chemical laboratory. Detailed dimensions, specifications, and methods of manufacture are included.

Cat AK-54 is issued by Schaar & Co., Dept. CP, 754 W. Lexington St., Chicago 7, Ill. When inquiring specify CP 8322 on handy form, pages two and three.

## LEFAX POCKET SIZE TECHNICAL DATA BOOKS \$1.25 EACH

Printed on loose leaf, 6 hole, 6 3/4" x 3 3/4" bond paper; each book contains about 140 pages of technical data, presenting condensed, accurate and essential data for the student, engineer, technical worker and business man.

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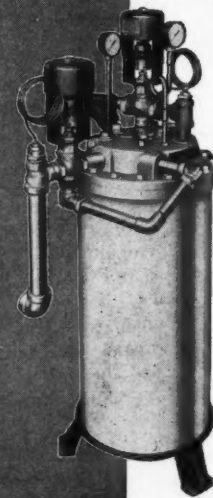
LEFAX Dept. CHP 7 Philadelphia 7, Pa.

When inquiring check CP 8323 on handy form, pgs. 2-3

Abundant  
Hot  
Water

AT  
Two  
TEMPERATURES

from One Compact Heater



Get abundant washroom water regulated at a safe 120° F., or water direct from tank simultaneously for scalding purposes at 160° F. to 180° F.

A "package" unit especially designed to afford uncommon safety and high efficiency. It is delivered completely assembled, tested and adjusted. Simply attach pipes, then turn on water and steam.

The latest development in a compact heater of high quality for industry and institutions.

Write for literature.



**THE COE MANUFACTURING COMPANY**  
503 BANK ST. PAINESVILLE, OHIO

When inquiring check CP 8324 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Evaporates liquid from surface  
and allows bulk of solution  
to remain cool . . .**

infrared heater gives rapid concentration without bringing solution to boiling

**Uses:** Infrared heater is used in laboratory for concentration or evaporation to dryness.

**Features:** Instead of inducing evaporation by boiling, surface layer of liquid is heated to produce high rate of evaporation by infrared. Since energy is absorbed by surface layer, bulk of liquid in the vessel and vessel itself remain relatively cool.

**Description:** Infrared heaters are made of fused silica. Thus, they are moisture proof and acid resistant. Designed for operation with 110 or



Made of fused silica, infrared units are acid-proof

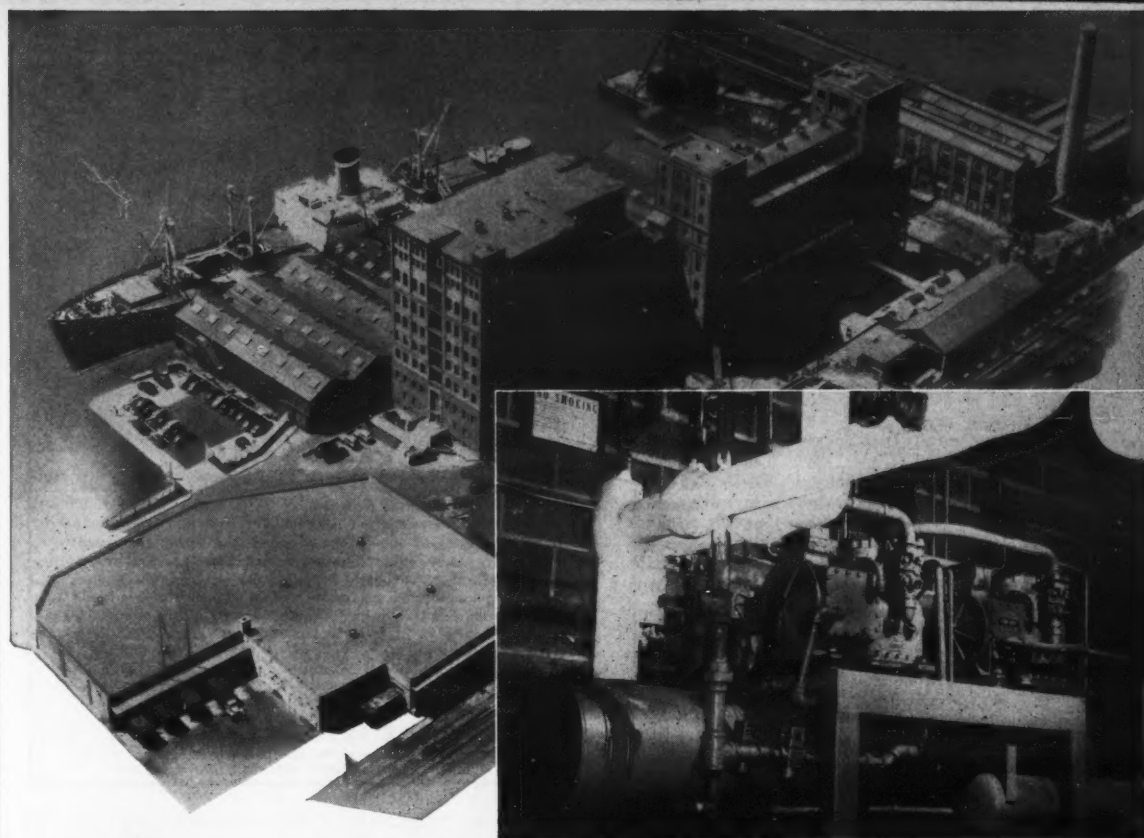
220v, units produce 300 or 500 watts of infrared radiation. Radiation falls mainly in the range from 14,000 to 40,000 Angstroms.

(Epiradiator is a product of Quartz Products Corp., Dept. CP, Keasbey, N. J. . . or for more information check CP 8325 on handy form, pages two and three.)

**Details ovens, furnaces  
for every laboratory**

Illustrations and tables show and describe a variety of laboratory ovens and furnaces in four-page, two-color bulletin. In addition, a series of water baths is covered.

Bul 1153 is issued by The Emil Greiner Co., Dept. CP, 20-26 N. Moore St., New York 13, N. Y. When inquiring specify CP 8326 on the convenient Reader Service slip which is located between pages 2 and 3.



**Acme FLOW-COLD® used in processing  
life-saving blood plasma substitute . . .**

DEXTRAN, a blood plasma substitute, is manufactured by the Dextran Corp. of Yonkers, N. Y., a subsidiary of Refined Syrups & Sugars, Inc. Used effectively in Korea, this miracle product can be made in unlimited quantities, requires no special storage or shipping precautions, obviates the need for blood typing, and eliminates the danger of transmitting liver ailments. Its cost is only one-fourth that of plasma.

Since May, 1951, an Acme Flow-Cold Packaged Liquid Chiller has been used in the processing of

Dextran. Its function is to cool the solution at one phase of the process. A 15 HP Flow-Cold is used and furnishes 60 GPM of 40° water.

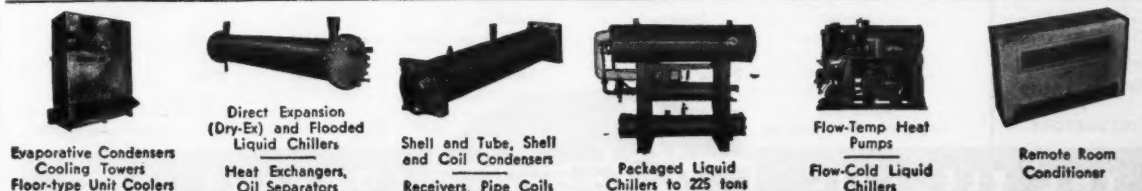
The Flow-Cold was specified for the job by Abraham Abrams, Consulting Engineer of New Rochelle, N. Y. Its compact size, peak efficiency, and ease of installation and maintenance made it a natural for this job. But this is only one example of the many uses to which the Acme Flow-Cold may be put. It is possible that this small, compact, sturdy unit can help you solve a troublesome temperature control problem. Write for information.



**ACME INDUSTRIES, INC.**

*Mfgs. of a complete line of Air Conditioning and Refrigeration Equipment*

JACKSON, MICHIGAN



Evaporative Condensers  
Cooling Towers  
Floor-type Unit Coolers

Direct Expansion  
(Dry-Ex) and Flooded  
Liquid Chillers  
Heat Exchangers,  
Oil Separators

Shell and Tube, Shell  
and Coil Condensers  
Receivers, Pipe Coils

Packaged Liquid  
Chillers to 225 tons

Flow-Temp Heat  
Pumps  
Flow-Cold Liquid  
Chillers

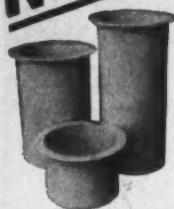
Remote Room  
Conditioner

Continuously serving the air conditioning and refrigeration industry since 1919

When inquiring check CP 8327 on handy form, pgs. 2-3



# NOW! IOLYTE LAMINATED FIBERGLAS\* CROCKS



- PRACTICALLY UNBREAKABLE
- CHEMICALLY RESISTANT
- LIGHTWEIGHT
- INEXPENSIVE
- NOT TAPERED

\*Trade mark of Owens-Corning Fiberglas Corp., Toledo, O.

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10	9"	36"	30.00	40	18"	36"	59.00
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12	16"	14"	30.00	27	22"	18"	49.00
15	16"	18"	35.00	30	22"	20"	53.00
20	16"	24"	40.00	55	22"	36"	70.00
30	16"	36"	49.00	73	22"	48"	83.00
40	16"	48"	59.00	55	28"	22"	76.00
14	18"	12"	35.00	95	28"	36"	98.00
20	18"	18"	40.00	125	28"	48"	125.00
26	18"	24"	45.00				

Distributor Territories Open

Order from us or from your distributor. Unless rated firm, payment with order. No C.O.D.'s. All prices FOB, L.I.C. Ask about Iolyte Ducts, Stacks, Tanks, Hoods, etc.

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FACTORY: 59-31 54TH STREET, MASPETH, L. I.

When inquiring check CP 8328 on handy form, pgs. 2-3

## NOW AVAILABLE AS A MODERN EXECUTIVE TYPE DESK CRADLE PHONE



## The WHEELER SOUND POWERED Electric TELEPHONE

... a proven time and step-saver requiring no batteries or outside power connection ... is now available as a handsome executive-type desk cradle phone.

Developed especially to meet the need for extra "private wire" communications between executive offices and other frequently called locations. Helps to relieve regular intercom equipment and switchboards of overload. Invaluable emergency "standby" in case of power failure. NO BATTERIES. Nothing to renew or replace. Easy to install.

For more about the uses and types of installation possible, write for Bulletin SA 32.

## the WHEELER INSULATED WIRE CO., Inc.

Division of The Sperry Corporation  
1112 East Aurora Street, Waterbury 20, Connecticut

1WH54A

When inquiring check CP 8329 on handy form, pgs. 2-3

## FOR THE LABORATORY

### Color cards shows 36 spectra of common elements

Full-color printing is used to duplicate entire visible spectrum on pocket-size card. Superimposed on this are flame spectra of 36 common elements from barium to yttrium. Scale shows emission lines from 300 to 900 millimicrons.

Flame Spectrum Card FC-11 is issued by Beckman Instruments, Inc., Dept. CP, 820 Mission St., South Pasadena 1, Calif. When inquiring specify CP 8331 on handy form, pages 2 and 3.

### Controls temperature, humidity for testing variety of materials ...

can achieve relative humidity anywhere from 18 to nearly 100%, temperature from -20 to 200°F

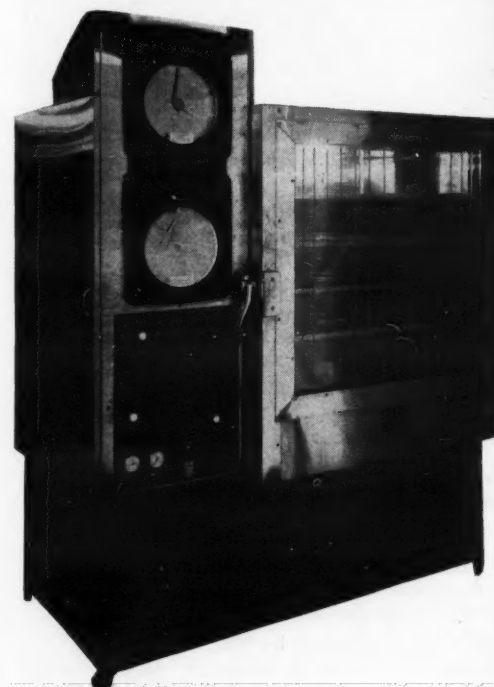
**Uses:** Cabinet is used in testing greases, packaging materials, plastics, fabric, tools, chemicals, metallurgical and pharmaceutical samples, or any other materials which may be affected by temperature and humidity.

**Features:** Relative humidities from 18 to just under 100% can be achieved.

**Description:** Control temperature and humidity test cabinet is built specifically for any type of moisture vapor tests within the limits of -20° to



No. 620



Can be equipped with conventional or electronic controls for temp, humidity

## Hotpack GLASS DRYING OVENS

For Rapid Drying & Sterilizing of Lab Glassware and as a Utility Oven for various other Lab Tasks

### SPECIFY

**Hotpack**  
CONTROLLED TEMPERATURE EQUIPMENT

- OVENS
- Laboratory
- Safety
- Table Top
- Industrial
- ROOMS
- FURNACES
- STERILIZERS
- STILLS
- WATER BATHS
- INCUBATORS

### GRAVITY CONVECTED

TEMPERATURE RANGE — ROOM to 360°F

Temp. Dif.  $\pm 5^{\circ}\text{C}$

Hotpack Gravity Convected Glass Drying Ovens are specially designed units primarily intended to dry laboratory glassware.

Its thermostatically controlled heat automatically removes all moisture from the articles.

While its accuracy of control is not as close as our Laboratory Drying Ovens — it is suitable for many other uses in the lab of a utility nature.

The interior is entirely of stainless steel, the exterior is heavy gauge steel, rustproofed and finished in grey enamel.

Model No.	TWO SIZES			Maximum Temp. Range	Insulation	Watts	Volts	F.O.B. Phila.
	W	D	H					
620	30	20	72	360°F	2"	2400	220	\$525.00
622	36	24	72	360°F	2"	3600	220	\$725.00

Send for Complete Information

Sold and Serviced only Thru Trained Factory Representatives

THE ELECTRIC  
5033 COTTMAN ST.



COMPANY, INC.  
PHILADELPHIA 35, PA.

When inquiring check CP 8330 on handy form, pgs. 2-3

## FOR THE LABORATORY

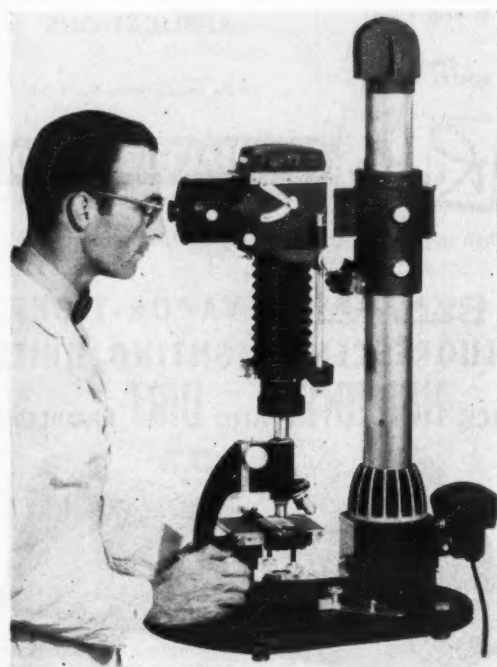
200°F. Temperature and relative humidity are controlled by conventional or electronic control units.

(Type 15-CF Humidity Test Cabinet has been developed by Dept. FM-9, Package Materials Laboratories, Inc., Dept. CP, 461 Crescent Road, Hatboro, Pa. . . . or for more information check CP 8332 on handy form, pages 2 and 3.)

### Camera unit can be used with any standard microscope . . .

simplicity allows personnel without special training to do laboratory photography

Uses: For photomicrography, photomacrography, general lab photography, photocopying, enlarging, and micro-projection.



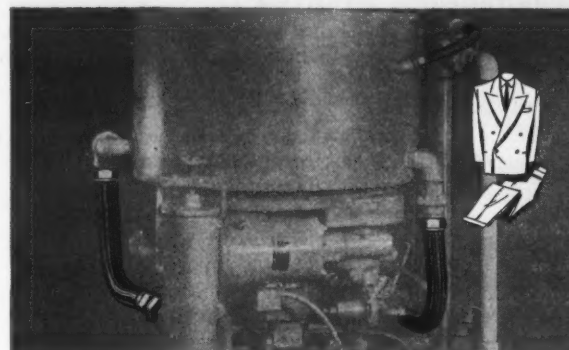
Features: Unit can be used with any standard microscope.

Description: Unit is comprised of a completely integrated reflex camera and a controlled light source. Camera unit swings back for instant use of the microscope. Base mount provides finger-touch regulation of intensity, color temperature, and size of illuminated field. It also includes built-in color filters.

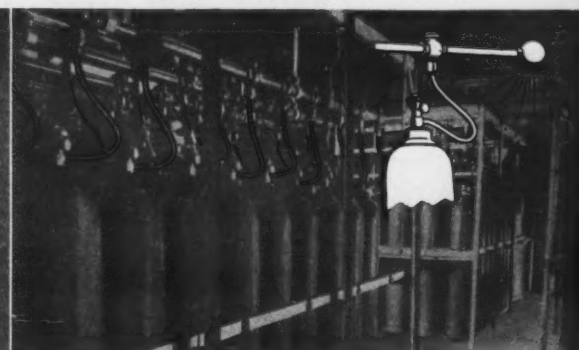
Camera uses color or black and white film, either 120 roll size, 2 1/4 x 3 1/4 sheets or film pack, or 35 millimeters.

(Orthophot is a product of Silge and Kuhne, Dept. CP, 16th and Carolina St., San Francisco, Calif. . . . check 8333 on handy form, pages 2 and 3.)

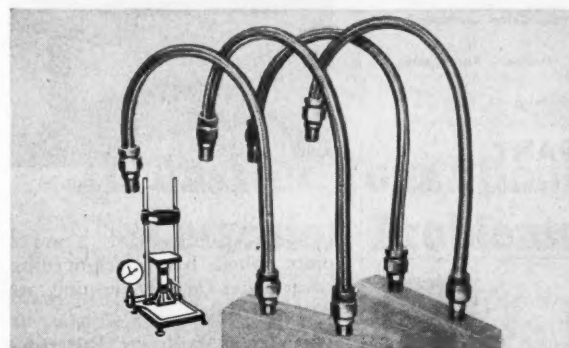
## Pick an idea—lick a design problem...



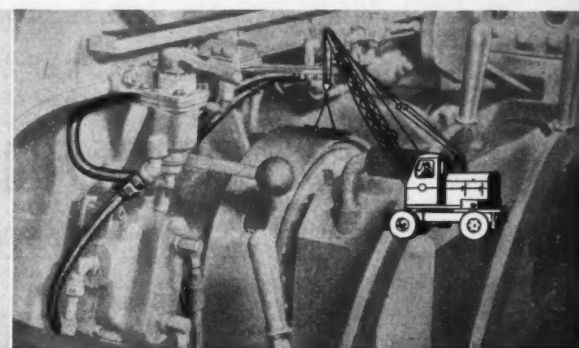
**END VIBRATION AND LEAKAGE.** Titeflex® metal hose, used as fill and drain lines of SEC Synthetic Cleaning Units, kills vibration and prevents solvent leakage at fittings. Tough, wear-and-corrosion-resistant Titeflex is just as effective in handling steam, oil, lubricants, fuels, gases, brine, acids, compressed air or oxygen. Design and construction of Titeflex assure trouble-free performance. Excellent for projects involving extreme configurations.



**CONTROL CRITICAL PRESSURES.** How would you connect 280 cylinders of fire-extinguishing carbon dioxide at 850 psi to line? Walter Kidde & Company licked this problem with Titeflex flexible metal hose which met all insurance standards and withstood rigid application requirements. Titeflex also conveys hundreds of different fluids under as many different temperature and pressure conditions. Resists corrosion, vibration, physical abuse.



**CONDUCT STEAM SAFELY.** Plates for Carver Laboratory Press carry steam up to 200 psi (nearly 400°F.) for heating—water for cooling. The connections are flexible, pressure-safe Titeflex. Braiding gives extra strength. Added problems of vibration, pulsation, continuous movement, corrosion or abrasion make Titeflex invaluable in scores of other applications.



**FIGHT FATIGUE AND WEAR.** Titeflex metal hose eliminated maintenance on air control lines of Unit Mobile Cranes. All-metal construction, with braiding woven directly upon the hose, provides great strength and resistance to vibration, corrosion, wear and abuse. Flexibility of Titeflex permits simplified assembly even where space configurations are problems.

**THE USES FOR TITEFLEX®** seamed flexible metal hose and Uniflex seamless flexible metal hose are limited only by engineering ingenuity. And Titeflex design engineers—working with customers—develop new applications daily. Somewhere in your plant or on your products Titeflex can improve operation and maintenance—or simplify a design problem. Our new 48-page *Metal Hose Catalog No. 200* shows you how and why. To get your free copy, simply mail the coupon.

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## Titeflex

TITEFLEX, INC.  
509 Frelinghuysen Ave.  
Newark 5, N.J.

Please send me without cost information about the products checked at the left

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When inquiring check CP 8334 on handy form, pgs. 2-3



## YOUNG BROTHERS OVENS and DRYERS

for accurately  
controlled  
temperatures

in

BAKING

DRYING

CURING

DEHYDRATING

OF  
Chemicals and  
Pharmaceuticals

Electrically heated,  
multiple shelf-type dryer.

Young Brothers Ovens and Dryers are  
engineered and built to secure uniform  
results through their accurately controlled  
temperatures and positive air circulation.

Among leading concerns using Young  
Brothers Ovens are Reichhold Chemicals,  
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Upjohn Co., Atomic Energy Commission, E.  
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Standard and Special Designs, Batch and  
Conveyor Types.

Write for Bulletin 17.



Estab. 1896

**YOUNG BROTHERS COMPANY**

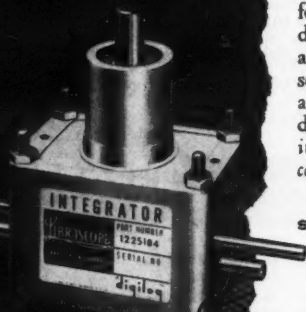
1825 Columbus Road

Cleveland 13, Ohio

When inquiring check CP 8335 on handy form, pgs. 2-3

## BALL AND DISC INTEGRATOR

PRECISION  
LONG SERVICE



The Ball and Disc Integrator  
is a precision (.01%) inte-  
grating mechanism with  
super-finished balls and tung-  
sten carbide disc. A special  
oiling device provides per-  
manent lubrication. Small  
size, light weight and design  
simplicity make it suitable  
for use in: totalizing, rate  
determination, differential  
analyzers, or as a closed loop  
servo-element. Also effective  
as a precision variable speed  
drive. Write for detailed catalog  
information on this or other  
computing, controlling devices.

### SPECIFICATIONS:

Width: 1 3/4", Length 2 3/4",  
Height 3 1/4", Weight 21 oz.

Computers and Controls

**LIBRASCOPE**

A DIVISION OF GENERAL PRECISION EQUIPMENT CORPORATION

LIBRASCOPE INCORPORATED

1607 FLOWER ST., GLENDALE, CALIF.

When inquiring check CP 8336 on handy form, pgs. 2-3

## LABORATORY

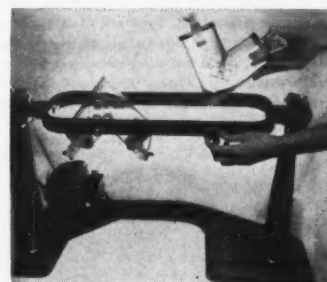
Mix lab samples fast  
and accurately  
with blender . . .

unit handles 1 to 4 pint lots

Uses: Small scale laboratory  
blender mixes loads up to four  
pints.

Features: Yoke model can be  
interchangeably mounted in stand-  
ard 4 and 8 quart frame made by  
manufacturer.

Description: Blender shells are  
made of heavy, transparent lucite



Blender with one-pint shells

in load capacities of 1, 2 and 4  
pints. Shells have quick-opening  
cover plates for easy cleaning, are  
dust and watertight.

(Blender is made by Patterson-  
Kelley Co., Dept. CP, 346 War-  
ren St., East Stroudsburg, Pa. . . .  
or more more information check  
CP 8337 on handy form, pages  
two and three.)

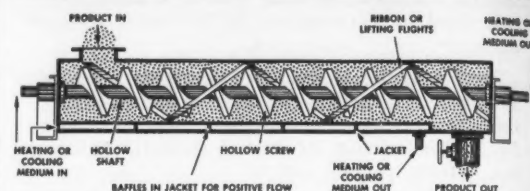
Tells how color error  
can be computed

Article in "Gardner Labora-  
tory Newsletter" describes a  
color difference computer.  
Two-color, four-page publica-  
tion also describes other equip-  
ment of interest to the paint  
laboratory.

Color difference computer is  
designed for operation with a  
three-color component system.  
It has a motor-driven dial  
which reads directly in Δ E.

Vol 1 No. 1 of "Gardner News-  
letter" is issued by Gardner  
Laboratory, Inc., Dept. CP,  
4723 Elm St., Bethesda, Md.  
When inquiring specify CP  
8338 on handy form, pages  
two and three.

## Continuous-Action



**Rietz THERMASCREWS**

FREE  
Laboratory tests  
of your products

PILOT PLANT  
EQUIPMENT for use  
in your plant

Small  
RENTAL UNITS

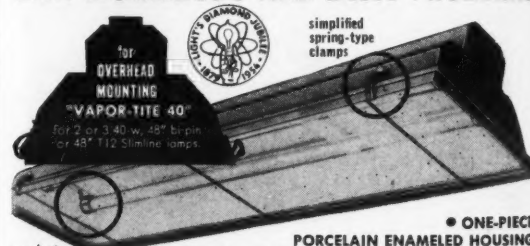
for COOLING  
HEATING  
DRYING  
Many HEAT EXCHANGE  
APPLICATIONS

Write for bulletin No. T-506

**Rietz MANUFACTURING CO.**  
128 Todd Road, Santa Rosa, Calif.

When inquiring check CP 8339 on handy form, pgs. 2-3

## BENJAMIN VAPOR-TIGHT FLUORESCENT LIGHTING UNITS LICK HUMIDITY AND DIRT PROBLEMS

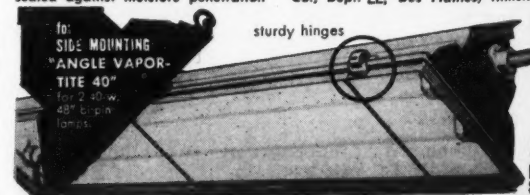


exclusive  
"Springlox"  
lampholders

- ONE-PIECE  
PORCELAIN ENAMELED HOUSING
- SEALED INTERIOR—no place for rust to get a foothold!
- COVER UNSNAPS IN A JIFFY
- LAMPS CUSHIONED AGAINST VIBRATION

Where excessive dirt, dust, smoke,  
corrosive fumes or moisture-laden air  
present lighting problems, the  
best answer is Benjamin Vapor-Tight  
Lighting Equipment. These units with-  
stand such adverse atmospheres with  
a minimum of maintenance and  
trouble-free performance. They're  
sealed against moisture penetration

by an extruded rubber gasket and  
moist-proof conduit entrances. They  
defy humidity with an over-all  
coating of "Life-Time" porcelain  
enamel. For full details on how to  
lick your problems of lighting humid  
and dirty locations, send for FREE  
BULLETIN VT. Benjamin Electric Mfg.  
Co., Dept. LL, Des Plaines, Illinois.



When inquiring check CP 8340 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## FOR THE LABORATORY

### Routine weighings, moisture determinations faster with semi-automatic scale . . .

balance features five-second damping, large capacity, high sensitivity

**Uses:** As a general purpose laboratory balance.

**Features:** Scale features five-second damping for greater speed in routine weighings and moisture determinations, with "Moisture Teller" plus large capacity (1000gm), high sensitivity (20 mg). Final weighing, reading of moisture percentage is fully automatic.

**Description:** No. 240 Speed Balance is equal-arm, enclosed-beam, deflection design. Gram scale, graduated 0 to 10 gm by 1/10 gm, is at eye level, reads right to left. Moisture scale reads 0 to 20% left to right. Handling of weights or riders under 10 gm is eliminated.



Semi-automatic balance speeds routine weighing

Dead beat oil damping brings needle to rest in five seconds, saving time formerly consumed in shifting riders and counting swings.

Zero adjustments are made by levelling two discs at front of base. Combined pan and beam arrest operates from knob in center of base.

In operation, material to be weighed is placed on righthand pan, weights to 10 gm on left. Needle swings to left, indicates unit grams and tenths.

For moisture tests, Moisture Teller pan is placed on right pan, its counterweight plus 40 gm on left. Sample is added until needle hits zero on moisture scale, giving sample of 50 gm. Pan is replaced on scale after drying; needle immediately gives correct per cent, moisture.

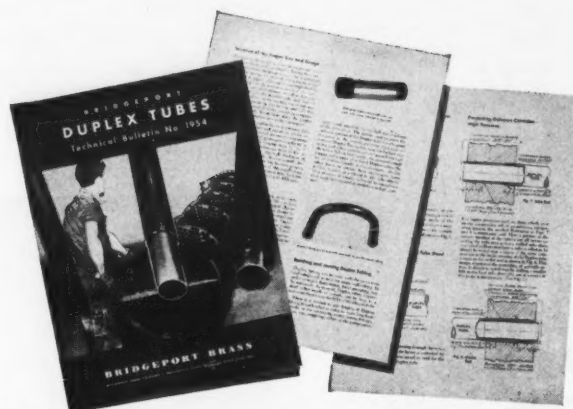
(No. 240 Speed Balance is a product of Harry W. Dietert Co., Dept. CP, 9330 Roselawn Ave., Detroit 4, Mich. . . . check CP 8341, pages 2 and 3.)

## BRIDGEPORT BRASS COMPANY CONDENSER AND HEAT EXCHANGER TUBE EDITION

# COPPER ALLOY BULLETIN

BRIDGEPORT  
CO.

MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND. — IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



## To Answer Your "Double" Corrosion Problems

Many heat transfer installations must stand up under corrosive attack from two different media at the same time . . . one inside and one outside the tubes. In many applications, tubing of a single metal cannot withstand this double onslaught for very long. The answer is found by combining two metals, each highly resistant to one of these corrosive conditions, into a Duplex tube.

The story of Bridgeport Duplex Tubing, drawn from 15 years of successful service, is now graphically told in Bridgeport's newly published *Duplex Tubes Technical Bulletin No. 1954*. In concise, quick-reading language, supported by ample illustrations and comprehensive charts and tables, this Bulletin describes the most important features of construction, application, selection and installation of Duplex Tubing to profitably solve many double corrosion problems.

### Variety of Metal Combinations

Bridgeport Duplex Tubes are supplied in many combinations of ferrous and nonferrous metals, each chosen to resist the particular combination of corrosive media involved.

For chemical plants producing colorless formaldehyde, Duplex Tubing with Admiralty Brass outside for brackish

water, and aluminum inside for formaldehyde has made an excellent record. Equal results have accrued in oil refining and natural gas processing with stainless steel outside to resist various corrosive petroleum vapors, and copper or copper alloy inside toward fresh circulating water.

In other applications, Red Brass, Aluminum Brass or Cupro Nickel to the water or steam side, and low carbon steel, nickel, lead, tin, etc., to the product side have been very satisfactory.

### Many Products Handled

The list of possible products and their combinations that can be suitably handled by Duplex Tubing is virtually endless. The following are a few of the more common items:

Ammonia	Food Products
Amines	Formaldehyde
Beverages	Formic Acid
Boiler Water	Fruit Juices
Carbonated Liquids	Gums
Carbon Dioxide	Hydrogen Sulfide
Chemicals	Mercury
Coke By-Products	Nitric Acid
Cooling Water	Oils
Compressed Air	Petroleum Products
Cosmetics	Plastics
Drugs	Resins
Dyes	Refrigerants
Explosives	Soaps
Fatty Acids	Steam
Fertilizers	Sulfuric Acid
Flue Gases	Varnishes

### Other Advantages

Aside from the unique advantage of custom-tailored corrosion resistance on both sides of your tubes, Duplex Tubes often give better impingement corrosion resistance, higher heat transfer rates, reduced fouling and slime, or higher operating temperatures, depending on the particular metal combination and operating conditions involved.

For example, careful heat transfer tests run on tubes of copper, steel, and copper/steel Duplex showed a higher heat transfer rate by far for the copper/steel Duplex than for the tube of steel alone. The tests also showed that in double wall tubes of the same material, there is virtually no reduction in heat transfer across the metal bond. This fact is the result of an excellent mechanical bond between the two concentric metals in Duplex Tubing, assured by Bridgeport's method of manufacture.

### Installation Data

The *Duplex Tubes Technical Bulletin* also contains information on Selection of Proper Size and Gauge of Tubes, End-Annealed Tubes, Overcoming Galvanic Corrosion by Cutting Back Duplex Tubes, Bending and Joining Duplex Tubes, Provision for Thermal Expansion, and Provisions for Reducing Turbulence.

A complete section on methods of installation states that most combinations of Duplex Tubing can be expanded or rolled into the tube sheet in the same way as ordinary condenser or heat exchanger tubes, but offers precautions on several specific types. Detailed cutaway line drawings complete this presentation.

### How to Get Your Copy

The *Bridgeport Duplex Tubes Technical Bulletin No. 1954* will be of valuable help in your double corrosion problems. Request your copy today on company letterhead. And for your condenser or heat exchanger tube requirements, or assistance on your corrosion problems, contact our nearest branch office.

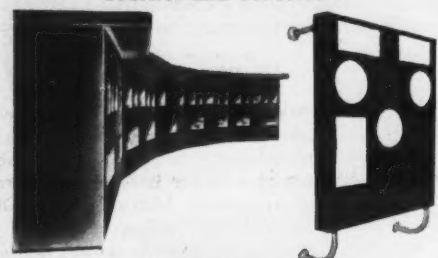
(1684)

When inquiring check CP 8342 on handy form, pgs. 2-3



# Specify FALSTROM -for INSTRUMENT PANELS

Custom Steel Controlboards,  
Cubicles and Consoles—



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of Panelboards, Control  
Centers and Special Assemblies

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STEEL, ALUMINUM, COPPER, BRASS,  
STAINLESS STEEL AND OTHER ALLOYS

FALSTROM Panels are popular in chemical, refinery, and power plants nationwide. Standard designs, by FALSTROM, are the economical solution to all but the most unusual instrument mounting requirements. Where special problems indicate custom designing, FALSTROM engineers can design and build complete structures to meet your installation timetables. Call or write for information!

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**FALSTROM COMPANY**

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When inquiring check CP 8343 on handy form, pgs. 2-3

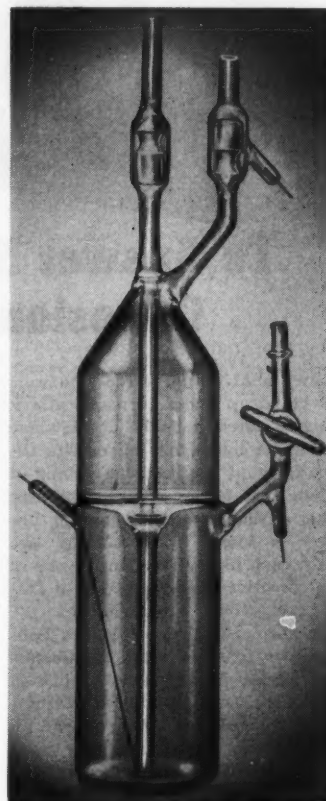
## LABORATORY

**More piston volume,  
greater safe speed  
in pump design . . .**

unit is more compact, cuts  
mercury movement

Pump is used for quantitative transfer of gases and volatile liquids for gas analysis; analysis for absorbed gas in solids; reactions in vacuum line apparatus.

Designed by Dr. Grant Urry, U. of Chicago, pump incorporates following improvements over early Toepler units: more com-



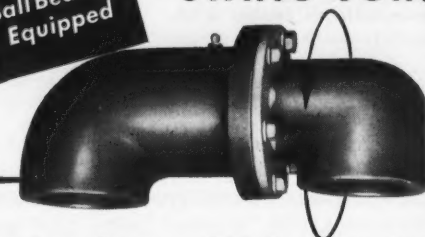
Pump offers safe, smooth operation at high speeds

compact, it requires less rack space; better support for mercury is possible; minimum movement of mercury allows larger piston volume and safe, smoother operation at high speeds; more efficient use of mercury is attained.

(Urry Automatic Toepler Pump is manufactured by Wakefield Industries, Inc., Dept. CP, 5108 W. Grove St., Skokie, Ill. . . . check CP 8345, pages 2 and 3.)

**NEW!**  
Ball Bearing  
Equipped

## BARCO SWING JOINTS



### for Loading and Unloading Lines

**BARCO'S** new, attractively priced, all-steel ball bearing *Swing Joints* are specifically designed to provide for movement and flexibility in metal pipe loading and unloading lines handling gasoline, oil, alcohol, chemicals, and other fluids.

**11 DIFFERENT STYLES**—Barco offers single swing, double swing, and counterbalance styles to meet every need. Sizes 2", 2½", 3", 4".

**SUPERIOR DESIGN**—The ball bearings will not fall out when joints are taken apart. Long bearing provides adequate pipe support. Special O-ring seal insures leakproof service over wide temperature range, -40°F to +225°F.

**INFORMATION**—Send for latest Catalog No. 400 and engineering information. **BARCO MANUFACTURING CO.**, 537F Hough St., Barrington, Illinois. A Chicago Suburb

When inquiring check CP 8346 on handy form, pgs. 2-3

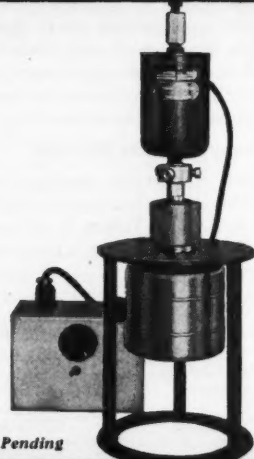
## AUTOCLAVE ENGINEER'S Magne Dash\*

### HIGH PRESSURE AUTOCLAVE

1. No Stuffing Box
2. Magnetically Operated Agitator
3. Positive Agitation
4. Adjustable Timer to Vary Agitation Cycle
5. No External Moving Parts
6. Internal Parts Type 316 Stainless
7. Furnished with Thermocouple Well and 4 Connections
8. Available in 100cc—250cc—500cc—1000cc Sizes
9. Pressure Rating—5,000 P.S.I.

WRITE FOR BULLETIN 1651

\*Licensed by Standard Oil Company of Indiana—Patent Pending

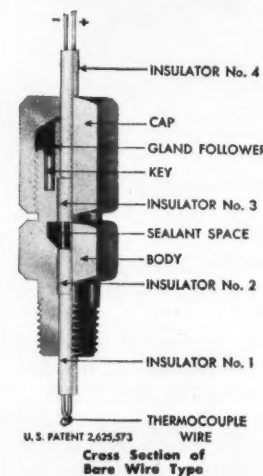


### AUTOCLAVE ENGINEERS, INC.

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LABORATORY & PILOT PLANT HIGH PRESSURE EQUIPMENT  
EXPORT DEPT. 751 • DREXEL BLDG. • PHILADELPHIA 6, PA.

When inquiring check CP 8344 on handy form, pgs. 2-3

## CONAX BARE WIRE AND QUICK DISCONNECT THERMOCOUPLES



Greater Speed and Accuracy of temperature sensing is provided by the exclusive features of Conax Patented Bare Wire Thermocouple Glands. Pressures range from full vacuum to 15,000 psi. and temperatures range from -300°F. to +2000°F. Stainless steel construction . . . small . . . compact size.

Also complete line of Packing Glands and Shielded Thermocouples.

Write today for fully illustrated, complete Conax Catalog.

**CONAX CORPORATION**  
4515 MAIN STREET  
BUFFALO 21, N.Y.



Quick Disconnect Type

When inquiring check CP 8347 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## FOR THE LABORATORY

### Plan laboratory setup with scaled "3-D" models . . .

correspond to maker's lab furniture to enable efficient visual planning

Easily assembled cardboard scale models of manufacturer's line of laboratory furniture offer convenient method of planning complete labs or adding facilities to those already in use.

Kit contains models of 26 pieces of metal lab furniture which are described in accompanying 28-page catalog. Also included are layout sheets



ruled to scale  $\frac{1}{2}$ " to the foot. When assembled, models can be placed on paper and shifted until desired laboratory plan results.

Assembled lab gives planner clear, "3-D" picture of how finished lab will appear.

(Lab Planning Kit is product of Labline, Inc., Dept. CP, 217 N. Desplaines St., Chicago 6, Ill. . . . or check CP 8348, pages two and three.)

### Provide full finger freedom, protection from chemicals with plastic gloves

**Uses:** In operations where protection from corrosive chemicals is needed together with freedom of movement. Gloves find wide use in laboratories or in handling miniature assemblies.

**Features:** Molded from unsupported polyvinyl film, gloves allow individual finger freedom.

**Description:** Complete range of sizes is available for both men and women. Gloves are resistant to most acids, oils, resins, and alkali solutions.

(Plastic gloves are a product of Houghton Laboratories, Inc., Dept. CP, 322 Bush St., Olean, N. Y. . . . or check CP 8349, pages 2 and 3.)

# "MUST" Reading for Plant Engineers

Table of contents		page
PREVENTIVE METALLURGY TO MAINTAIN TUBE HEALTH	The life span of a condenser tube depends upon the water and operating conditions and the alloy selected.	3
PROTECTIVE FILMS ARREST CORROSION	Life expectancy is prolonged if protective films form soon after service begins.	6
REVERE MINUTE MEN IN CONDENSER TUBE WAR	"Trouble shooters" serve as liaison between tube users and Revere Research Laboratory.	10
DEVELOPMENT WORK IN TUBE ALLOYS	Experiment in Revere laboratories develops basic knowledge of tube performance under variable conditions.	11

• We doubt very much if you have ever read a booklet on Condenser Tubes, quite like this one.

Plant engineers should find it of unusual interest in these times when it is more important than ever that every last ounce of use be squeezed out of the condenser tubes in their plants.

This 28-page booklet includes data on various copper alloys, photos of cut-away tube sections showing various types of corrosion encountered in condenser tube service and photomicrographs showing the grain structure of different kinds of metals under varying operating conditions.

Send for your copy today. Please make request on your firm's letterhead. Thank you. Revere Copper and Brass Incorporated, 230 Park Avenue, N. Y. 17, N. Y.

## REVERE COPPER AND BRASS INCORPORATED

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Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.—Sales Offices in Principal Cities, Distributors Everywhere

SEE "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

When inquiring check CP 8350 on handy form, pgs. 2-3



## IS YOUR MEASURING PROBLEM HERE?

### FREQUENCY

Production quantities  
Nuclear radiations  
R.P.S. and R.P.M.  
Power line frequencies  
Very low frequencies  
Frequency stability  
Oscillator calibration  
Pulse repetition rates  
Weight, pressure,  
temperature, acceleration

### TIME INTERVAL

Elapsed time  
between impulses  
Pulse lengths  
Camera shutter speed  
Projectile velocity  
Relay operating times  
Precise event timing  
Interval stability  
Frequency rates  
Phase delay

Investigate this NEW, low-cost  
all-purpose -hp- counter.



-hp- 522B  
ELECTRONIC  
COUNTER

This new electronic counter can save you time and money by speeding and simplifying research and manufacturing measurements. It is a compact, low-cost, extremely versatile instrument offering you accurate frequency, period or time measurements. It performs all functions without extra-cost modification. Results are displayed instantly and automatically in direct-reading form. Unskilled personnel can use the instrument immediately without training.

WRITE FOR COMPLETE OPERATING  
AND APPLICATION DETAILS

Data subject to change without notice.

### HEWLETT-PACKARD COMPANY

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SALES REPRESENTATIVES IN ALL PRINCIPAL AREAS



INSTRUMENTS FOR COMPLETE COVERAGE

When inquiring check CP 8351 on handy form, pgs. 2-3

## LABORATORY

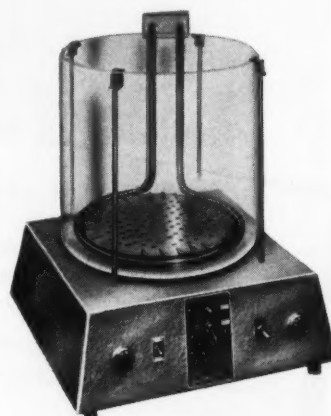
**Stirrers, circulators replaced  
by magnetic agitator  
in jar bath . . .**

provides more working space  
and high visibility

Uses: For maintaining controlled temperature for laboratory tests.

Features: Temperature control having dual micro switch contacts permits operator to select two most used temperatures automatically. Other temperatures may be selected without disturbing the two preselected temperature settings. Holds temperature to within 0.1°C.

Description: Agitation is maintained by means of the pulsations



Perforated plate moves to provide  
gentle agitation

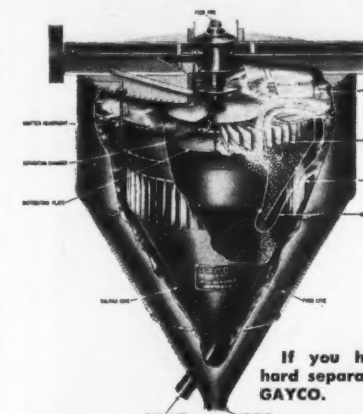
of a perforated agitator plate. Plate is pulled downward by electromagnet in base support. Actuation of magnet is accomplished by means of selenium rectifier, condenser, and timed relay. Unit comes in two temperature ranges, ambient to 70°C and ambient to 100°C. Pyrex-brand glass jar is available in three standard sizes (8 1/4 x 8, 12 x 12, and 16 x 12"). Two pilot lights of 1" diameter flash red and green respectively to denote operation and when heater element is energized.

(Magni-Whirl Jar Baths are a product of the Blue M Electric Co., Dept. CP, 306 W. 69th St., Chicago 21, Ill. . . or for more information concerning manufacturer's product, reader may simply check CP 8352 on handy form located between pages 2 and 3.)

## GAYCO CENTRIFUGAL SEPARATORS

GAYCO Separators, equipped with the adjustable centrifugal sizing fan — an exclusive GAYCO feature — make closer separations. Closer separations bring about higher production through efficient removal of the fines made by the mill. Closer separations bring about higher quality products by eliminating all undesirable oversize.

**"TIMKEN BEARING EQUIPPED"**  
GAYCO brings you all these:



Range 60  
to 400 mesh  
greater  
capacity  
25 to 30%  
greater  
production  
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Tailings  
Uniform  
Products  
Slow speed for  
slow wear  
Quick and easy  
adjustments

If you have an exceptionally  
hard separating problem, TRY THE  
GAYCO.

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Factory and Laboratory, Kingston, N. Y.  
117 LIBERTY STREET NEW YORK 6, N. Y.  
Canadian Representative: F. H. Hopkins & Co., Ltd.,  
8500 Decarie Blvd., Montreal, Que.  
When inquiring check CP 8353 on handy form, pgs. 2-3



*"Saved Cost of  
New Warehouse"*

says  
PALTIER USER

## Paltier STORAGE SYSTEM



increases  
storage  
space up to  
**75%**  
and more —  
decreases  
man handling  
as much as  
**75%**

ASK US: PALTIER studies your storage problem  
—engineers and designs a system for  
your specific needs.

Many PALTIER installations pay for themselves  
"right from the start."

This booklet tells the PALTIER story,  
ask for it today.

THE PALTIER CORP.

1713 Kentucky St., Michigan City, Ind.

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CHEMICAL PROCESSING

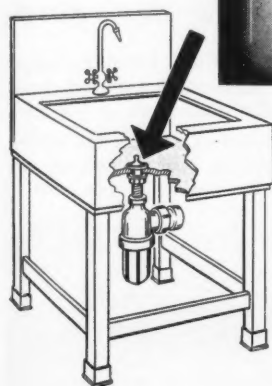
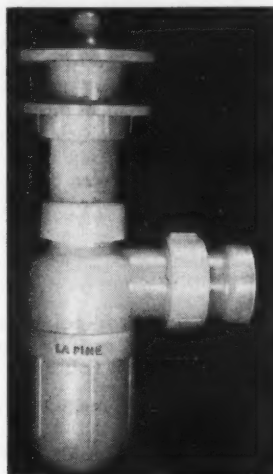
## FOR THE LABORATORY

### Chemical, acid resistant sink unit made of polyethylene . . .

trap may be removed in a minute without tools

Made entirely of polyethylene, sink unit consists of stopper, high level drain, strainer, lock-nut, plug, trap, and outlet union. It may be installed on any laboratory sink.

Polyethylene is resistant to mineral acids, alkalis, hydrofluoric acid, and fluorine compounds. Abrasive materials



Has all-polyethylene construction and can be installed or removed for cleaning without tools

and mercury do not affect sink either. Trap screws off by hand and can be reinstalled as a watertight joint with a few turns.

(Sink Unit is a product of Arthur S. LaPine and Company, Dept. CP, 6001 S. Knox Ave., Chicago 29, Ill. . . or for more information concerning manufacturer's product, reader may simply check CP 8355 on the convenient Reader Service slip which is located between pages 2 and 3.)

### Explains uses for 5.1 pH indicator solution

Printed in three colors, vest-pocket size booklet contains eight pages of information about methyl-purple indicator solution. Indicator shows end-points in the neighborhood of 5.1 pH by turning from bright green to gray to purple. Booklet explains how it can be used in titrations in place of methyl-orange.

"Methyl-Purple Booklet" is issued by Fleischer Chemical Co., Dept. CP, P. O. Box 616, Washington 4, D. C. When inquiring reader may simply specify CP 8356 on the convenient Reader Service slip which is located between pages two and three.



Producers of . . . "The Metal Without an Equal"

## AMPCO\* METAL

### ... the special alloys that make good where other metals fail

HERE are some of the properties of Ampco Metal that help you keep production up, costs down:

- Excellent resistance to corrosion in certain media.
- High tensile and compressive strength.
- Unusual resistance to wear from abrasion, erosion, and cavitation pitting.
- High physicals at extreme temperatures.
- High rate of heat transfer.
- High impact and fatigue values.

Because it combines all of these qualities, Ampco Metal is often called The Metal Without an Equal.

No matter what you do — whether you work in the chemical or process industries, refine oil, run a steel mill, make stampings, generate power, or any of hundreds of other jobs, you can make Ampco Metal work for you. It saves operating headaches and pro-

duction grief, because it often makes good where other metals fail.

These versatile special alloys fight wear, corrosion, impact, fatigue; give long life and dependable performance under the severest conditions. That's why they are widely used in such tough assignments as fractionating towers, exchanger components, slippers and screw-down nuts for blooming mill service, aircraft parts, dies, valves, bushings, and other punishing jobs.

Chances are Ampco Metal can help you, too. It's available in sand and centrifugal castings, sheets, plates, bars, tubes, extrusions, welding wire and electrodes. Consult your nearby Ampco field engineer or write us for full information.

\*Reg. U. S. Pat. Off.

### AMPCO METAL, INC.

Dept. CP-5 • Milwaukee 46, Wisconsin  
West Coast Plant, Burbank, California



Ampco Metal, Inc.  
Dept. CP-5 • Milwaukee 46, Wisconsin

I am interested in learning more about the properties and uses of Ampco Metal in the process industries. Please send me literature.

Name.....Title.....

Company.....

Company Address.....

City.....(.....) State.....

When inquiring check CP 8357 on handy form, pgs. 2-3





## PHOSPHATE COATINGS TO MAKE YOUR PRODUCT DURABLE\*

### PIONEERING RESEARCH AND DEVELOPMENT SINCE 1914

For more than a third of a century, ACP research chemists and ACP technical representatives in the field have pioneered in the science of metal preservation. They have developed surface treating chemicals which either protect metals directly, or create a superior bond for decorative and protective paint finishes, and now, ACP chemicals and processes are being used the world around to reduce costs, speed production and add to the life-span of countless products.

ACP metal protective chemicals include: protective coating chemicals for steel, zinc and aluminum; metal cleaners and rust removers; final rinse controls; pickling acid inhibitors; copper coating chemicals; soldering fluxes; alkali cleaners and addition agents; copper stripping and brightening solutions.

#### PAINT BONDING

**"GRANODINE"**® zinc phosphate coatings improve paint adhesion on automobiles, refrigerators, projectiles, rockets, and many other steel and iron fabricated units or components.

**"LITHOFORM"**® zinc phosphate coatings, make paint stick to galvanized iron and other zinc and cadmium surfaces.

**"ALODINE"**® protective coatings provide improved paint adhesion and high corrosion-resistance for aircraft and aircraft parts, awnings, wall tile, signs, bazookas, and many other products made of aluminum.

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**"PERMADINE"**® zinc phosphate coatings provide rust and corrosion proofing for nuts, bolts, screws, hardware, tools, guns, cartridge clips, and many other industrial and ordnance items.

#### PROTECTION FOR FRICTION SURFACES

**"THERMOIL GRANODINE"**® manganese-iron phosphate coatings provide both rust proofing and wear resistance — anti-galling, safe break-in, friction on rubbing parts.

#### IMPROVED DRAWING AND COLD FORMING

**"GRANODRAW"**® zinc phosphate coatings make possible improved drawing, cold forming and extrusion on such steel products as sheets for stamping, bumpers, parts to be formed, prior to plating or painting, cartridge cases, etc.

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In Protective Coatings For Metals . . .

### AMERICAN CHEMICAL PAINT COMPANY

General Offices: Ambler, Penna.

Detroit, Michigan

Niles, California

Windsor, Ontario

When inquiring check CP 8358 on handy form, pgs. 2-3

#### FOR THE LABORATORY

##### Shows several models of power supply

Illustrated three-color, eight-page catalog shows five models of electronic power supply. One miniature unit described measures only 8 x 5 x 5 1/2".

"Power Supplies" is issued by Allied Engineering Div., Allied International Inc., Dept. CP, Connecticut & Richards Aves., South Norwalk, Conn. When inquiring specify CP 8359 on the convenient Reader Service slip which is located between pages two and three.

##### Electro polarizer-galvanometer duo simplifies and speeds analysis of most plating solutions . . .

reported to save one-half of normal analysis time

**Uses:** Most plating solutions, including copper cyanide, zinc cyanide, cadmium, brass, and nickel, can be analyzed with the equipment.

**Features:** Electro polarizer utilizes the polarographic method of analysis, which chemists estimate saves half the time formerly consumed by



Simplified chemical analysis of plating solutions is made possible with electro polarizer and portable galvanometer

the chemical method. Manufacturer's records show that routine analysis of copper cyanide solutions which formerly took an hour now can be done in 15 to 20 minutes and with a high degree of accuracy.

**Description:** The equipment used for the analysis consists of a Patwin Electro Polarizer and a High Sensitivity Portable Galvanometer. The former unit eliminates need for maintaining and standardizing several solutions.

Actual analysis of solutions follows the conventional polarographic procedure — generation of currents within the solution as a result of externally-applied potentials. The highly sensitive galvanometer is necessary to measure low values of current or

## FOR THE LABORATORY

voltage, and use of this unit instead of a built-in galvanometer makes possible a standard case for the electro polarizer.

(Electro polarizer is a product of Patwin Instruments Co., Dept. CP, Waterbury, Conn. High Sensitivity Galvanometer is manufactured by General Electric Co., Dept. CP, One River Rd., Schenectady 5, N. Y. Check CP 8360 on handy form, pages 2 and 3.)

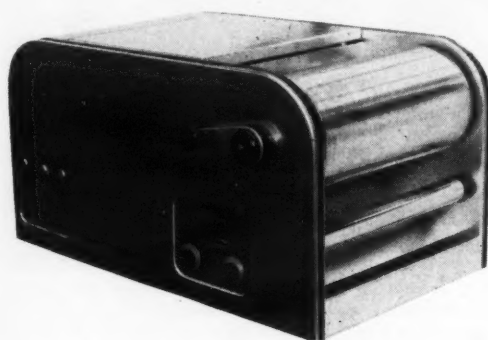
### **Unit completely processes, dries oscillographic records at speeds in excess of 10 fpm . . .**

operates without darkroom or external water

**Uses:** Completely processes and dries oscillographic records on any standard recording papers up to 12" in width.

**Features:** Compact design and portability — allows use at actual test site. Immediate check may be made of recorded data.

Daylight operation — self-contained unit can be operated in a normally illuminated room without danger of fogging the record being processed.

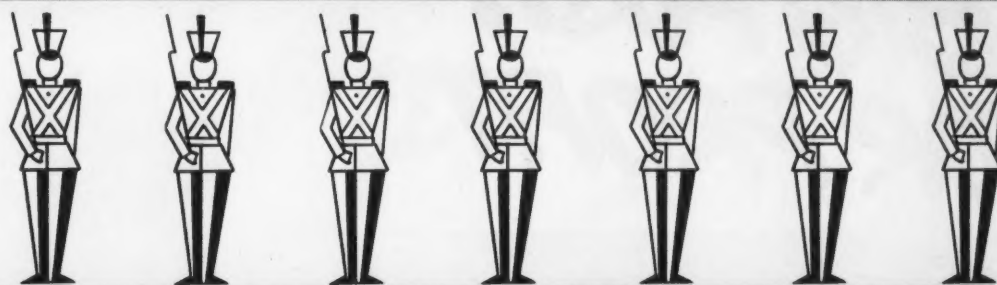


Saves time in processing of oscillograms

**Description:** The Type 23-109 Oscillogram Processor measures only 17 x 31 x 18" — can be carried directly to test site. The unit is constructed of stainless steel with chemical-resistant controls and panels. Solutions are contained in stainless steel tanks and thermostatically maintained at 100°F to minimize ambient temperature effects. Cumulative footage which has been processed is shown on an indicator so that remaining solution life may be calculated. Drying-drum temperature is thermostatically controlled and may be adjusted by the operator for various humidity conditions, paper widths, and record materials.

Instead of the conventional fixing bath, a stabilizer solution is used, eliminating the usual washing procedure necessary with standard photographic processing procedures.

(Oscillogram Processor is a product of Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 8, Calif. . . . or for more information check CP 8361, pages 2 and 3.)



## UNIFORMITY

### **. . . Another Big Advantage of WELDCO *Welded* TUBING**

When you order WELDCO Tubing, you're sure to get complete uniformity throughout—uniform wall thickness, uniform weight, uniform I.D. and O.D., uniform close grain structure, and uniform workability. These are some of the important advantages of welded tubing, and they guarantee you a dependable product . . . tubing that has excellent fabricating qualities . . . tubing that's easy to bend, form, weld and assemble.

Remember, too—only WELDCO Tubing is welded with the exclusive Double-Fusion Process. It's available in Stainless Steel, Monel, Hastelloy, Inconel, Nickel, and Cupro-Nickel, in tube and pipe sizes from 3" to 30", Schedules 5 and 10, and 3" to 12", Schedule 40. For special problems, or regular applications, always specify WELDCO—your best buy in top-quality, uniform tubing!

## WELDCO



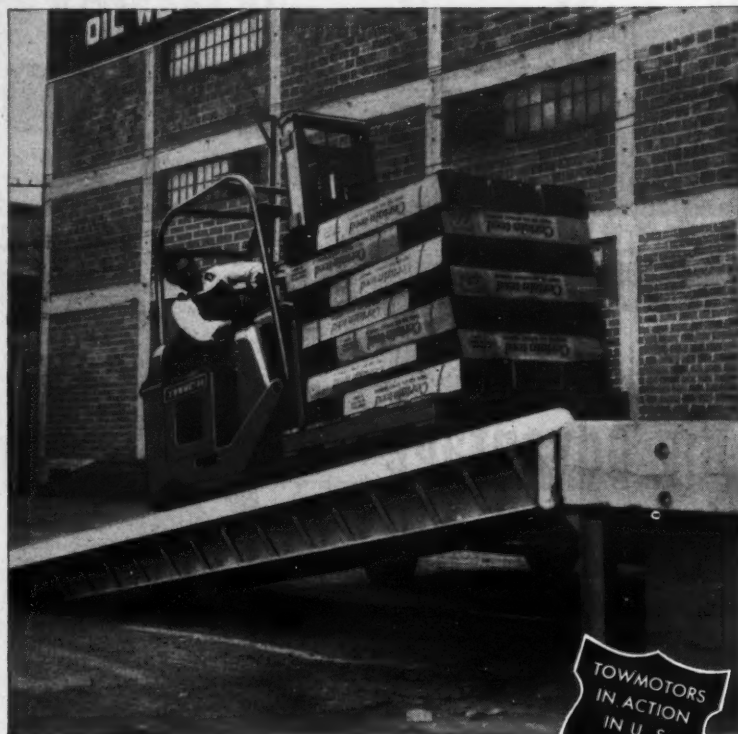
**Whatever Your Needs  
In Tubing . . .  
You're 'Way Ahead  
With WELDCO**

**THE YOUNGSTOWN WELDING & ENGINEERING COMPANY**  
3763 OAKWOOD AVENUE YOUNGSTOWN 9, OHIO

When inquiring check CP 8362 on handy form, pgs. 2-3



# BIG PUSH FOR PROFITS



Up a steel ramp with a full load of roofing material at Alamo Iron Works, San Antonio, Texas.

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IN ACTION  
IN U.S.  
INDUSTRY

**With production costs up** in every industry, it's *drive, drive, drive* every inch of the way to maintain profits. Many firms are doing it by slashing their materials handling costs with Towmotor **Mass Handling Equipment**, Towmotor Fork Lift Trucks speed production, stop manhour leakage, increase capacity. Join the big push for profits with Towmotor Equipment!

Write for "What Makes It Tick?," the inside story of Towmotor. Towmotor Corporation, Division 2305, 1226 E. 152nd St., Cleveland 10, Ohio.

**TOWMOTOR**  
THE ONE-MAN-GANG

**FORK LIFT TRUCKS and TRACTORS**

Since 1919

TOWMOTOR ENGINEERED FOR QUALITY PERFORMANCE

When inquiring check CP 8363 on handy form, pgs. 2-3

## material handling



Fast-moving 490-foot belt moves 1200 tons of sloppy material uphill every hour

1200 tons per hour of  
**wet, sloppy taconite**  
**moved uphill**  
**on steps of rubber**

**Utilizes belt which is easily adjusted to shed or retain water**

**Problem:** At the Radum, California plant of the Henry J. Kaiser Co., engineers were having trouble moving wet taconite uphill faster than it slipped down. Some method of dewatering material as it moved was needed.

**Solution:** Engineers installed a "Rifle-Grip" rubber conveyor belt. This belt has molded rubber ridges which stand 1/8" high and form a continuous series of chevron patterns spaced several inches apart.

Operating on a predetermined conveyor incline angle, with belt idlers also placed at a specified angle, the chevron-like ridges channel water to the belt's edge

CHEMICAL PROCESSING

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where it flows off. Material conveyed rests in center of belt and makes the trip free of water.

Adjustment of incline angle and angle of belt idlers change the chevron patterned surface into a series of horizontal carrying ribs which retain water on the belt and permit even distribution of moisture throughout material.

At the Radum installation, belt idlers were adjusted to form a trough shallow enough to let chevrons drain the load. Where water is to be retained, idler angle can be adjusted for a deeper trough. This produces a scoop-like form.

Trough depth for water retention is greater as belt incline becomes greater. Adjusted this way, the belt handles wet mixed material on steeper inclines that can be negotiated on a smooth surface belt. Design permits even distribution of water throughout material and prevents water from flowing to center of belt to dilute the material to the point where it will slide back on an inclined conveyor.

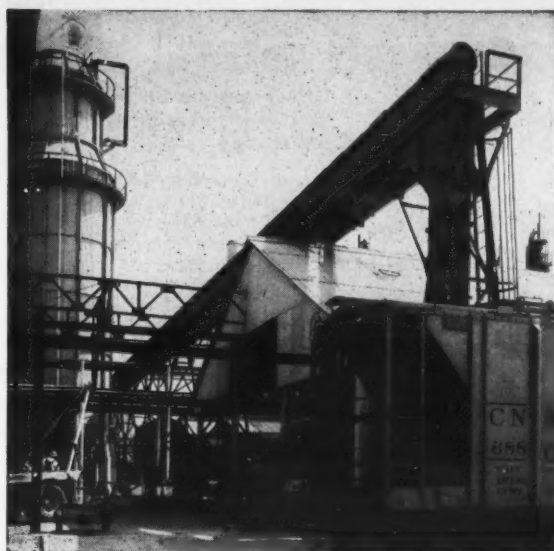


Molded, chevron-like rubber ridges on surface of conveyor belt (seen here from above) can be adjusted to shed or retain water contained in materials it conveys

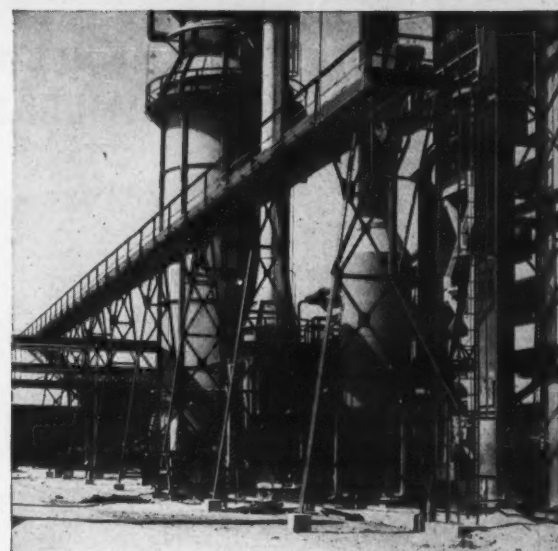
**Results:** The 490' belt is 42" wide and moves 500 feet per minute. It handles 1200 tons of sloppy material per hour up an incline of 18 degrees. Belt has been in operation one year and is expected to run for another three years.

(Rifle-Grip belt is a product of The B. F. Goodrich Co., Industrial Products Div., Dept. CP, 448 S. Main St., Akron 16, Ohio . . . or for more information check CP 8364 on handy form, pages two and three.)

Users of industrial electrical trucks can quickly size batteries for the job with data on pages 190 and 192



Hopper bottom car discharges to ZIPPER in shallow tunnel. After short, horizontal run, the ZIPPER rises vertically to 35' to clear buildings.



ZIPPER runs overhead 250 feet to discharge point. With a belt speed of 106 feet per minute, the conveyor can handle 10 tons per hour.

## ZIPPER CONVEYOR CARRIES CATALYST "Up-and-Over" Without Degradation

How to move bead catalyst from dump cars to a bucket elevator lifting to storage gave a tough problem to plant engineers at this Oil Company in Louisiana.

They couldn't use a conventional belt conveyor at ground level because of intervening buildings. To tunnel underground meant cutting through foundations and relocating pipe lines. The simplest way was to go overhead. But with conventional equipment this meant big power requirements and excessive degradation that would destroy much of the effectiveness of the catalyst.

The company's engineers came up with a smooth-working solution. They found that a single S-A ZIPPER Conveyor could follow the overhead route easily, using only light structural supports. But more important, because this remarkable conveyor *zips shut* after loading, it forms a snug, moving tube in which the bead catalyst cannot shift. *Degradation is practically non-existent*—and a 5 HP motor with Saco Speed Reducer provides all the power needed.

If you have a bulk materials handling problem that seems hard to solve, why not let our engineers look it over? Write us for a free survey.



Open Zipper Conveyor Belt rounds tail pulley and moves to loading point. Side walls then zip shut to form a snug fitting tube around the material.



### STEPHENS-ADAMSON MFG. CO.

11 Ridgeway Avenue, Aurora, Illinois • Los Angeles, Calif. • Belleville, Ontario

#### Engineering Division

Specialists in the design and manufacture of all types of bulk materials conveying systems.

#### Standard Products Division

A complete line of conveyor accessories including centrifugal loaders—car pullers—bin level controls—etc.

#### SealMaster Division

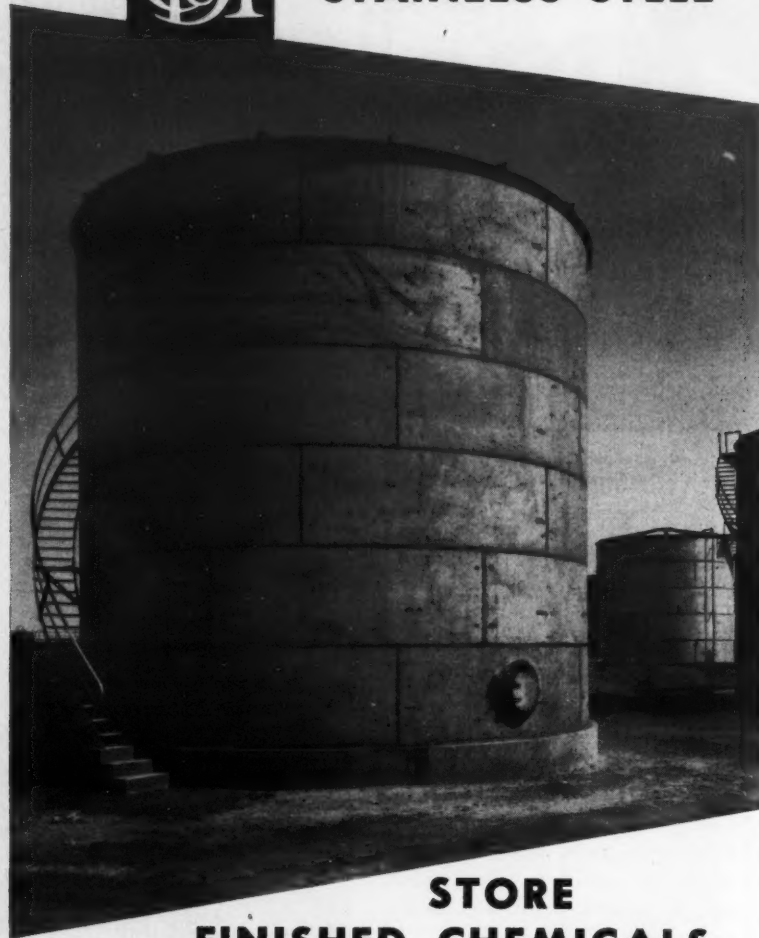
A complete line of industrial ball bearing units available in both standard and special housings.

When inquiring check CP 8365 on handy form, pgs. 2-3





## TANKS OF SOLID STAINLESS STEEL



### STORE FINISHED CHEMICALS

The 200,000-gal. solid stainless steel tank shown above is one of six Horton® tanks installed at Celanese Corporation of America's petrochemical plant at Pampa, Texas. The tanks, 33 ft. 6 in. in diam. by 30 ft. 6 in. high are used to store finished chemicals which are produced on an "around the clock" basis at Pampa. From the storage tanks, the chemicals are piped to special Celanese tank cars and shipped to their customers.

Horton stainless steel tanks of the type installed at Pampa are widely used for the storage of corrosive materials. We also build aluminum tanks and tanks lined or clad with corrosion resistant material. Write our nearest office for further information, estimates or quotations on any type of standard or special storage tank that you may require.

### CHICAGO BRIDGE & IRON COMPANY

Atlanta 3	2107 Healey Bldg.	Los Angeles 17	1536 General Petroleum Bldg.
Birmingham 1	1333 North Fifth St.	New York 6	3314-165 Broadway Bldg.
Boston 10	1007-201 Devonshire St.	Philadelphia 3	1650-1700 Walnut St., Bldg.
Chicago 4	2116 McCormick Bldg.	Pittsburgh 19	3208 Alcoa Bldg.
Cleveland 15	2212 Midland Bldg.	Salt Lake City 4	507 West 17th South St.
Detroit 26	1533 Lafayette Bldg.	San Francisco 4	1545-200 Bush St.
Havana	402 Abreu Bldg.	Seattle 1	1307 Henry Bldg.
Houston 2	2151 C & I Life Bldg.	Tulsa 3	1649 Hunt Bldg.

Plants at BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

When inquiring check CP 8366 on handy form, pgs. 2-3

### MATERIAL HANDLING

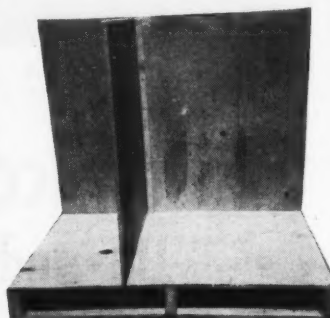
**Offset spacers on pallets give more versatility for storing . . .**

units accommodate crates, boxes of different sizes

**Uses:** For warehousing and transporting materials.

**Features:** Compact, safe and systematic storage of almost any merchandise, regardless of shape, on the same pallets.

**Description:** Plywood spacers of Heco standard pallets are removable. All-purpose partitioned pallets are also suitable



Spacer is removable

for storage jobs where weight-compression losses are frequent.

(Development of Hamerslag Equipment Co., Dept. CP, 45 Elmira St., San Francisco 24, Calif. . . . or for more information check CP 8367 on handy form, pages 2 and 3.)

**Bulk handling carrier weighs load received from hopper . . .**

delivers and dumps materials with stops at floor scales

**Uses:** For quick, precise weighing of bulk materials prior to handling and transferring in lots up to 1000 lb.

**Features:** Combines weighing and handling facilities in a single unit. Exact amounts can be emptied from bins or hoppers and moved to process or point of use. Eliminates any intermediate lost motion in placing material removed from storage on floor scales. Scale is brought to material rather than material being

Take an EXTRA Profit with **Weld-Bilt** Experience in Materials Handling!



One Midwest manufacturer saved \$90,000 on equipment cost alone because he called in a Weld-Bilt engineer FIRST, before deciding on expensive special-design units recommended to solve a

difficult handling problem. Our engineer, experienced in cost-saving shortcuts, showed how simple adaptation of more standard equipment could do the job even better.

This is the kind of service you can expect from WELD-BILT. . . a thorough analysis of your problems based on years of varied experience and wide knowledge, of handling problems. . . then a recommended solution that will do YOU the most good — in time and labor savings, in product protection, production speed-up — at the lowest cost. It may involve adapting standard equipment, custom-engineering new equipment — or merely realigning your present operations.

Call in the WELD-BILT Materials Handling Engineer for an economical solution to your problem today. You'll probably save money.

### WEST BEND EQUIPMENT CORP.

322 Water St., West Bend, Wis.

#### MATERIALS HANDLING ENGINEERS

Portable Elevators • Pallet Trucks • Single Stroke Lift Trucks • Two-Wheel Trucks • Platform Trucks • Skid Platforms.

When inquiring check CP 8368 on handy form, pgs. 2-3

### CHOOSE FROM 115 MODELS TO MEET YOUR EXACT NEEDS!



Only Ballymore ROLL-OR-GRIP all-welded-steel ladders assure you of just the right portable safety stair for each need. A standard size range from one to twelve steps; a choice of three safety treads (expanded steel lath, steel grip-strut, or rubber-clad steel plate); optional hinged shelves or removable baskets; and a wide choice of widths within each size—these extras add convenience to the superior safety features built into every Ballymore — the original — safety-step ladder.

### BALLYMORE Safety-Step LADDERS

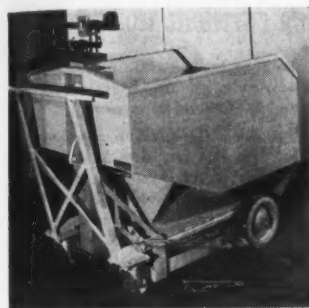
Factory-trained representatives in principal cities	To: BALLYMORE COMPANY, WAYNE 10, PA.	
	<input type="checkbox"/> Forward free catalog of Safety-Step Ladders. <input type="checkbox"/> Have representative call to survey my safety-ladder needs.	
	Name _____	Title _____
	Company _____	
Address _____		

When inquiring check CP 8369 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## MATERIAL HANDLING

brought to scale. In many instances need for built-in scales at hopper is eliminated.



Scale-equipped buggy can hold 18 cubic feet

**Description:** Bin of handling buggy is made of heavy 14 gage welded steel. Built-in adjustable double-beam scale has range up to 1000 lb. Hump gate is 8 x 14" and is controlled by extension handle at rear. Foot brake operates on two 10" rubber-tired wheels. Roller bearing casters are 6" size.

Also available is a similar unit of 15 cu ft capacity but without built-in scale.

(Eze-Move bulk unit with Fairbanks-Morse scale and Eze-Move bulk buggy are built by Burrows Equipment Co., Dept. CP, 1316 Sherman Ave., Evanston, Ill. . . . or for more information check CP 8370, pages 2 and 3.)

### Selection information on packings

Useful data book for mechanics and engineers contains conversion, steam, metal, and liquid tables. Also included is information on selection and installation of packing and properties of mechanical seal alloys.

Bul 385 is available from Dura-metallic Corp., Dept. CP, 2104 Factory St., Kalamazoo 24F, Michigan. Specify CP 8371, pages 2 and 3.

For more information on product at right, specify CP 8372 . . . see information request blank between pages 2 - 3.



## You Get Greater Flexibility Without Costly Installations When You MECHANIZE MATERIALS HANDLING With Tractor Shovels



When you put an Allis-Chalmers Tractor Shovel to work around your plant, it starts paying its way immediately. There is no down time for installation or costly plant alteration . . . no long training course for the operator. What's more, this one-operator machine not only saves many man hours, it gives you the benefit of several specialized units in one.

**As Materials Handlers,** Allis-Chalmers Tractor Shovels, with capacities from one to four cubic yards, pick up and carry all types of bulk, solid or packaged loads and deliver them anywhere in or around the plant. Storage areas may be changed at will. Special attachments — Lift Forks, Rock Forks, Bulldozers and Angledozer plus many others for some models — may be interchanged with the bucket in about 20 minutes.

**As Prime Movers,** these powerful crawler tractors can pull, lift or skid heavy machinery, spot railroad cars at loading docks. Traction and flotation enable these machines to work in snow or mud where wheel-mounted equipment bogs down.

**As Maintenance and Construction Machines,** Allis-Chalmers Tractor Shovels handle general clean-up work around the plant, build plant roads, excavate for new construction, clear snow . . . keep busy repaying your investment winter and summer.

Ask your Allis-Chalmers dealer to show you how the versatile Tractor Shovel is helping cut costs for thousands of owners. There are four sizes to fit your needs from the one-yard HD-5G to the four-yard HD-20G with torque converter drive.



Write for catalog describing the use of tractors in modern materials handling.

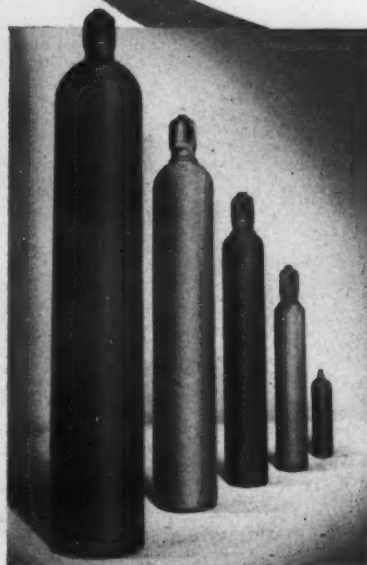
# ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



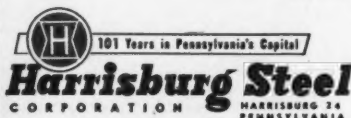
## Need Cylinders? Cylinders Problems?

consult **HARRISBURG STEEL**



... the biggest producer builds them best. In a complete range of sizes and capacities from 14 to 400 cubic feet... in both Domestic and Export types... to I.C.C. Specifications... for storage and transportation of fixed, liquid, and medical gases. If you need cylinders or have a technical problem concerning cylinders... consult us. Or write for a catalog and prices... today.

HSC-CC-1/54



When inquiring check CP 8373 on handy form, pgs. 2-3

<p>Tractor Model KT</p>	<p>Platform Model KN-KW</p>	<p>Tin Plate Model KTP</p>
<p>High Lift—Model KHL</p>		
<h3>HydroElectric LIFT TRUCKS</h3> <p>For the Heavy Load • For the Light Load • For the Unusual Load</p> <p>Look over the models illustrated. Some one of these trucks is adaptable to your needs. Whether you want to pull—push—carry or lift there is a model for every possible use. The many fleets of HYDROELECTRICS today carry products of every kind, shape and description are convincing evidence of their unusual application.</p> <p>Write today for FREE Catalog No. 35 featuring complete line of Lift Trucks.</p>		
<p>Rider tractor—Model KTR</p>	<p>Pallet—Model KPN-KPW</p>	<p>Tongue Lift—Model KTL</p>
<p><b>LIFT TRUCKS</b> INCORPORATED</p> <p>2423-31 SPRING GROVE AVE. CINCINNATI 14, OHIO</p>		

When inquiring check CP 8374 on handy form, pgs. 2-3

## MATERIAL HANDLING

**Doors swing in, swing out of their own accord for clear passage**

**Uses:** To save time in moving materials from one department to another.

**Features:** Doors open, stay open to allow men and materials to pass through, then close automatically. Units help maintain uniform temperature and humidity, minimize upkeep and replacement costs caused by hand trucks bumping against plant doors in opening.

**Description:** Magic Door Controls can be used in several applications. One is in operating a sliding door equipped with a



Those swinging doors cause less trouble, now

pull cord control; the other is a swinging door equipped with photo-electric control and manufacturer's Magic Door Operator for completely automatic operation. In addition, there are push-button and floor plate controls as well as mechanical controls.

(Development of the Magic Door Div., Dept. CP, The Stanley Works, 195 Lake St., New Britain, Conn. . . or for more information check CP 8375 on handy form which is located between pages 2 and 3.)

### Points up advantages of palletized truck

Bulletin of 16 pages gives specifications and dimensional drawings on eight models of battery-powered fork lift trucks having capacities from 1000 to 8000 lb. Page of



## LET Air MOVE YOUR CHEMICAL MOUNTAINS

VACU-VEYOR will reduce your bulk handling costs. It is a completely enclosed, portable, pneumatic system for conveying up to 40,000 pounds of material per hour.

Only one man is needed to direct the pick-up nozzle—the rest is fully automatic. Handles any dry, bulk material in powder, pellet, granular or crystalline form. Vacu-Veyor provides a simple, low-cost method of unloading trucks, ships or railroad cars. It will convey material as far as 350 feet—goes around corners or other obstacles—and is particularly useful for reaching into inaccessible spaces.

VACU-VEYOR pneumatic conveyors can be designed to handle practically any capacity, with portable or fixed installations as required.

For further information, write today to Dept. J-1309-1



When inquiring check CP 8376 on handy form, pgs. 2-3

## BREAK BIN BOTTLENECKS..

### with SPO air vibrators

**SERIES 81**

For steady flow of powdered and granular materials from bins, hoppers and chutes, specify SPO air vibrators. Key to their superior performance is a special corrosionproof cylinder liner. It assures (1) full-power starting, (2) thorough lubrication, (3) high-speed operation, (4) low air consumption, and (5) long life. Types and sizes to meet every need.

Write for Bulletin 50 for complete details.

**SPO INCORPORATED**  
6531 Grand Division Avenue • Cleveland 25, Ohio

When inquiring check CP 8377 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## MATERIAL HANDLING

photographs shows various models handling variety of materials.

Bulletin on Barrett Palletier is issued by Crescent Truck Div., Barrett-Cravens Co., Dept. CP, 4609 S. Western Blvd., Chicago 9, Ill. When inquiring specify CP 8378 on handy form located between pages 2 and 3.

### Forks easily exchanged on manually operated lift truck

**Uses:** For handling pallet loads up to 2500 lb in crowded areas.

**Features:** Five standard fork lengths of 30, 36, 40, 42, and 48" are interchangeable. Simple adjustment on frame also provides a 25 or 27" fork width.

**Description:** Truck weighs 299 lb and has full 270° steering arc.

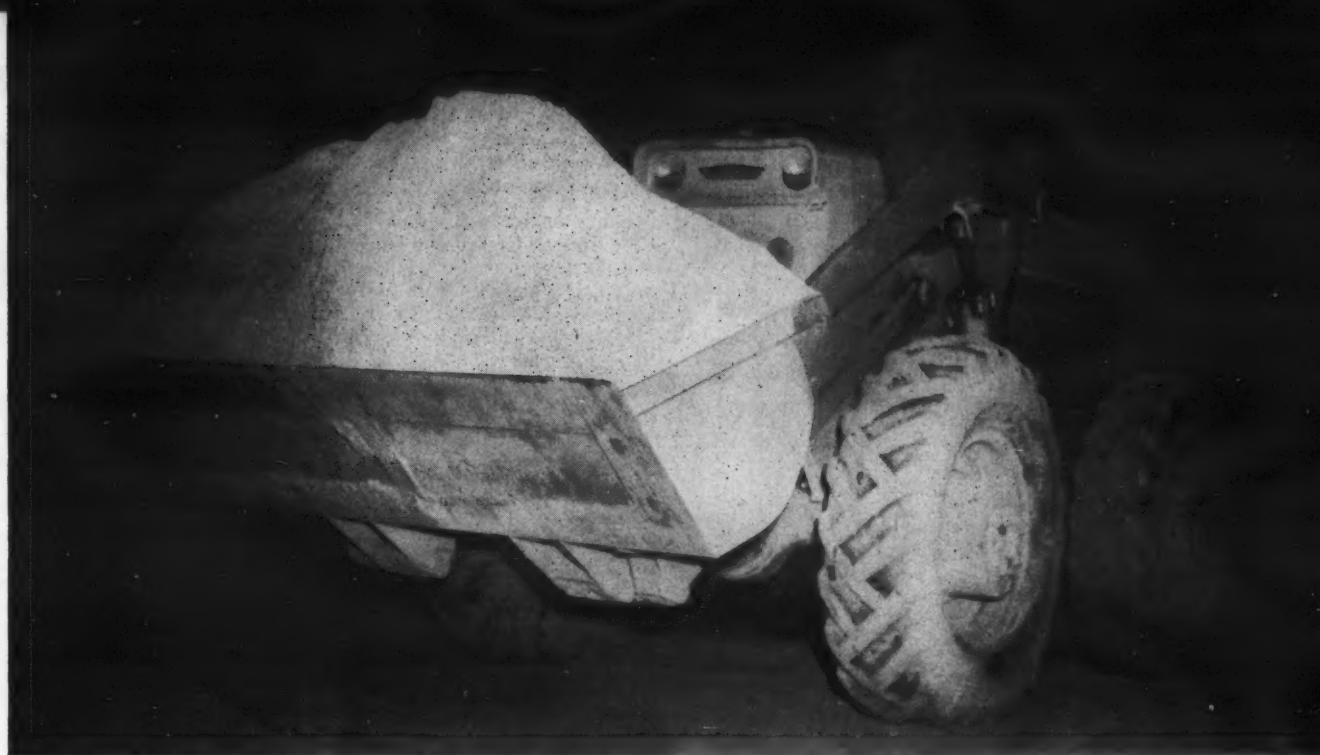


Has interchangeable forks

Lowered height is 31/4" and lift is 4". Front wheels are of resinoid type plastic, and rear wheels are of aluminum. A floor lock built into handle brakes truck.

(Truck is product of Rack Hydraulic Equipment Corp., Dept. CP, Connellsville, Pa. . . or for more information check CP 8379 on Reader Service slip, pages two and three.)

For more information on product at right, specify CP 8380 . . . see information request blank between pages 2 - 3.



## MICHIGAN *bucket control means* "Bigger Loads . . . . .FASTER"

Watch a MICHIGAN Tractor Shovel at work—with particular attention to bucket action—and you'll see how a MICHIGAN\* will handle bigger loads, move more yardage—faster, at considerably lower cost.

- Tremendous break-out power—ram the cutting edge into any tough, hard-to-dig clay, shale or loose rock—and work the bucket to loosen it
- Bucket roll-back at ground level—pick up and transport full buckets at low center of gravity for safe traveling, no void space in the bucket; more work in less time
- Remarkable digging ability—two large double acting cylinders on bucket and two large double acting cylinders on main lift give excellent control and superior digging action.
- Good bucket height and reach—high dumping clearance and ample forward reach make trucks easy to load.

Check these outstanding Quality Features of MICHIGAN\* Tractor Shovels . . .

1. Superior Bucket Action—bigger loads, faster loading
2. Clark Power-Shift Transmission—faster operating cycle gets more yardage
3. Clark Torque Converter—3-to-1 torque multiplication; power when needed—no conventional clutch
4. Clark Planetary Axle—relieves torque load on shafts and gears, prolongs machine life
5. Power Steering—much easier handling, lessens driver fatigue
6. Gas or Diesel—right power for the job; more horsepower than any comparable machine

Six models: capacities from 15 cubic feet to 2 1/4 cubic yards. Facts about the MICHIGAN Tractor Shovel are important—and interesting. The MICHIGAN Fact Folio contains specifications and action photos. The coupon gets it for you.

\*A Trademark of Clark Equipment Company

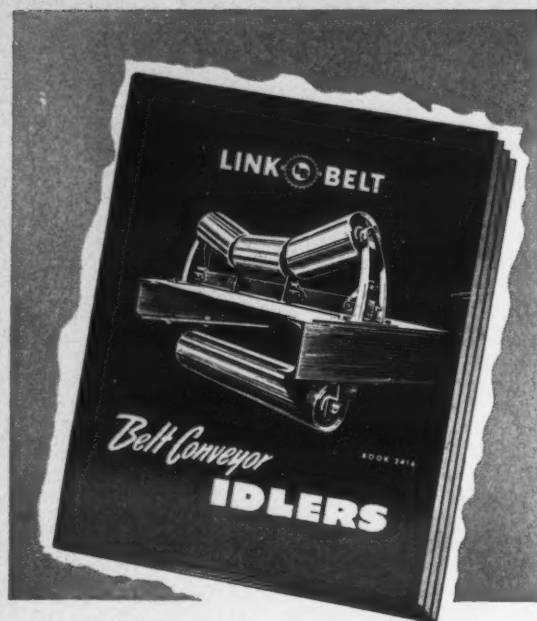


**CLARK  
EQUIPMENT**

CLARK EQUIPMENT COMPANY  
Construction Machinery Division  
434 Second Street, Benton Harbor, Michigan  
Please send the MICHIGAN Tractor Shovel Fact Folio

Name \_\_\_\_\_ Title \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_





## Get this new 48-page idler data book

Here's complete information on industry's  
most comprehensive line

**C**OVERS Link-Belt's entire roller bearing idler line of 34 types in seven basic designs. Includes all the facts you need for ordering and application: dimensions and specifications, selection and spacing data, recommended lump sizes, accessory information. Get your copy of Book 2416 today. Use the handy coupon below.

# LINK-BELT

BELT CONVEYOR IDLERS

LINK-BELT COMPANY  
Plants: Chicago, Indianapolis, Philadelphia,  
Colmar, Pa., Atlanta, Houston, Minneapolis,  
San Francisco, Los Angeles, Seattle;  
Scarboro, Toronto and Elmira, Ont. (Canada);  
Springs (South Africa); Sydney (Australia). Sales Offices,  
Factory Branch Stores and Distributors in Principal Cities.

LINK-BELT COMPANY  
220 S. Belmont Ave., Indianapolis 6, Ind.  
Please send me immediately a free copy  
of your 48-page Idler Book 2416.

Name .....  
Position .....  
Firm .....  
Address .....  
City..... Zn.... State.....

When inquiring check CP 8381 on handy form, pgs. 2-3

## MATERIAL HANDLING

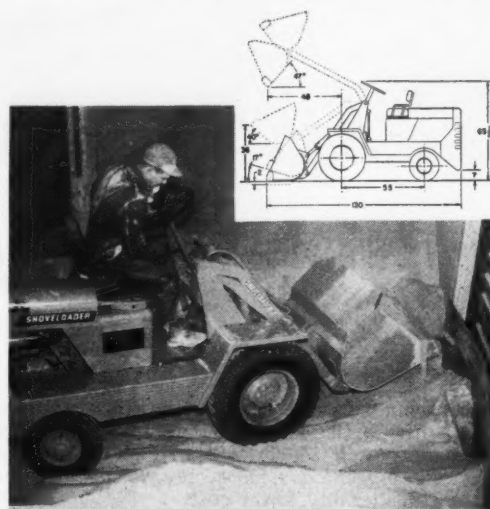
**Small turning radius allows tractor  
to load, unload with ease  
in cramped areas . . .**

unit operates with loader bucket, lift forks  
or special bucket and chain hook

**Uses:** Designed for bulk handling of materials  
when used with loader bucket. Equipment may  
be adapted for general purpose material handling  
with attachments.

**Features:** Turning radius of 90" enables equip-  
ment to be used in close areas such as boxcars,  
small bins, and stockpiles. Adjustable lift forks  
or special bucket and crane hook may be attached  
easily.

**Description:** Loader lifts 1500 lb of bulk  
material to 7' height. Bucket is 12 cu ft and  
suspends in low traveling position to afford com-



Turning radius of 90" makes loader suitable for  
handling bulk materials in boxcars

plete forward visibility. Unit has four forward  
(14 mph max) and one reverse speed. Spark-  
arresting muffler is standard equipment.

(Shovel truck is a product of Baker-Lull Corp.,  
Dept. CP, 314 W. 90th St., Minneapolis 20, Minn.  
. . . or for more information check CP 8382 on  
handy Reader Service slip which is located between  
pages 2 and 3.)

**Bags are unloaded and flattened  
at 1000 per hr speed**

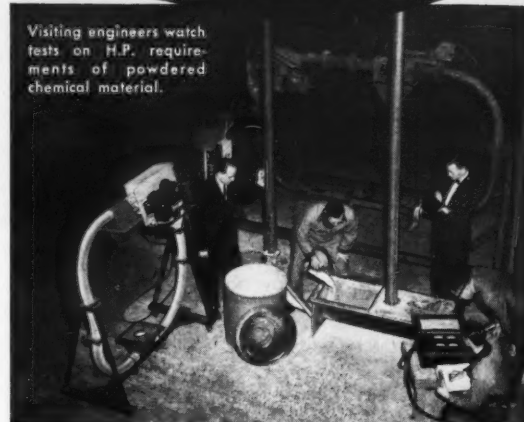
Box car and truck unloader carries bags on a  
flexible spring conveyor, through a hugger boom  
section which compactly flattens each bag. This  
allows easy storing in minimum space.

Powered by a 1½ hp gearmotor which also drives  
the flattener, the unloader runs at a speed of 120  
ft per min. It delivers up to 1000 bags per hr.

# HERE'S HELP!

## Hapman ENGINEERS PROOF-TEST your bulk flowable materials in TUBULAR CONVEYORS

Visiting engineers watch  
tests on H.P. require-  
ments of powdered  
chemical material.



**CAN YOUR PLANT'S BULK** flowable materials be han-  
dled — at maximum savings — by Hapman Tubular  
Flight Conveyors with Sealed-pin Chain? Very likely. . .  
*but there need be no guesswork about it!*

**AS A SERVICE TO YOU,** Hapman can proof-test a sample  
of your material — wet or dry — to determine its con-  
veying characteristics. Often tests are not needed, be-  
cause years of operation have been logged with scores  
of materials . . . from metal chips and carborundum  
dust to foods, pharmaceuticals, coal and chemicals.

**IF SECRECY REQUIRES,** a test conveyor can be shipped  
to your plant at nominal cost. Hapman Engineers coop-  
erate fully in solving bulk materials handling problems.  
Because Hapman Conveyors are liquid-tight, dust-tight,  
explosion-proof, you'll find them *amazingly adaptable*.  
Request details, mentioning material you wish to handle.

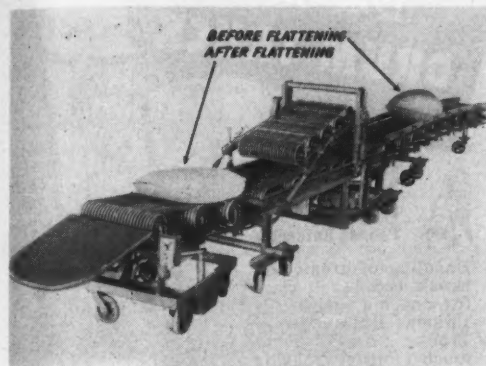
WRITE TODAY FOR BULLETIN CP-554

**Hapman CONVEYORS, INC.**  
DIVISION HAPMAN-BUTTON COMPANY  
KALAMAZOO MICHIGAN

When inquiring check CP 8383 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## MATERIAL HANDLING



Runs at 120 ft per min

Flexible section of conveyor is equipped with side rails which steer the bags properly into flattener. Discharge end is equipped with hydraulic jack for raising and lowering when loading to pallets.

Conveyor can be supplied in any length. Pictured unit is 26' overall, 24" wide, with a 15' flexible section coupled to an 11' rigid section.

(Conveyor and flattener attachment are manufactured by Flexoveyor Mfg. Co., Dept. CP, 1220 S. Acoma St., Denver 19, Colorado . . . or for more information check CP 8384, pages 2 and 3.)

### Lift, lower, hold work loads weighing up to 3 tons with mobile lift . . .

unit comes in four sizes, is powered by two-speed, hydraulic foot pump

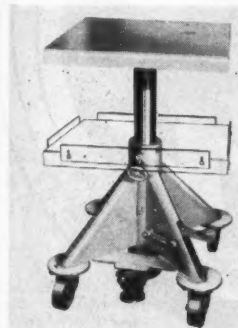


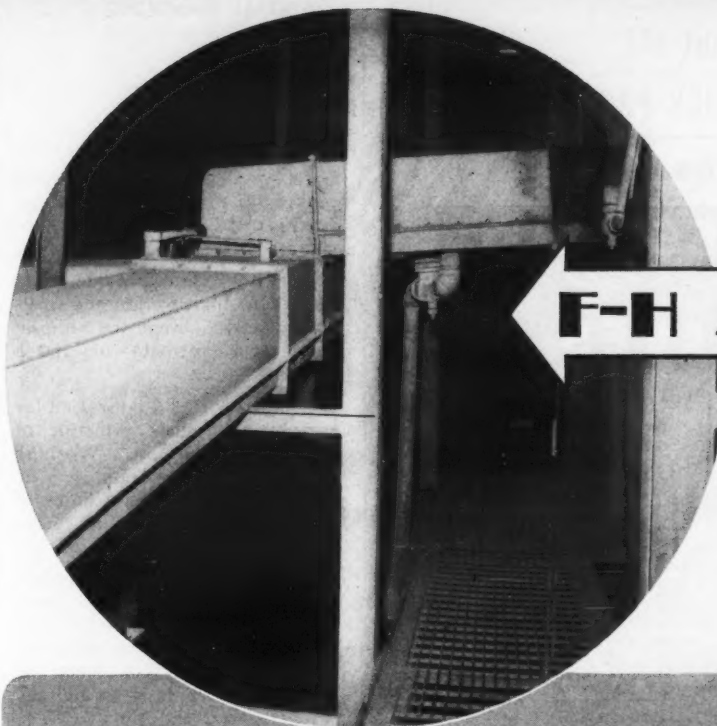
Table rotates full 360°

**Uses:** For handling and positioning of heavy items.

**Features:** Positioning of work throughout cycle—lift, hold, and lower—is accomplished through use of two-speed, hydraulic foot pump. Downstroke, under power, permits bench-line positioning.

**Description:** Mobile lifts are available in four sizes: 1000, 2000, 4000 and 6000-lb capacities. Full 360° rotation of work top may be locked at any point without restricting lift and lower mechanism. Table top is fabricated from heavy-gage steel. Floor lock and roller bearing wheels are standard equipment on all models.

(Mobile lifts are manufactured by Lange Lift Co., Dept. CP, 4275 N. 124th St., Milwaukee 10, Wis. . . . check CP 8385, pages 2 and 3.)



## F-H AIRSLIDE®

### WHAT OTHER CONVEYOR HAS SO MANY COST-REDUCING ADVANTAGES?

Ease of erection • Low maintenance • Dustless, noiseless operation • Ease in change of direction • High capacity with low headroom • Extremely low power consumption • Small volume of air at low pressure • Flexibility of plant design, not available with straight-line conveyors • Simple floor or overhead supports release valuable floor space • No lubrication • Less weight and bulk • Eliminates large stock of repair parts • No industrial accident hazards • Eliminates frequent and costly interruptions in production • Less costly labor charges to make repairs and replacements • No complicated and expensive drives, such as chains, belts, speed reducers, etc. •

The many convenient, money-saving features of the F-H Airslide make it almost indispensable in plants, processing gypsum, soda ash, fly ash, barytes, bentonite, Portland cement, flour, ground ores, alumina, catalysts, silica, phosphates, talc, resins, detergents and soap powders, magnesite; or any other dry, pulverized material which can be fluidized with low-pressure air, and economically conveyed from one location to another.

The adaptability of the Airslide allows it to be worked into existing plant and production setups with little, if any, rearranging of equipment. Straight or curved sections of

the Airslide can be suspended overhead, attached to wall space, or effectively placed out of the way along the floor. The Airslide can be applied to car, truck, ship loading and unloading; in-plant conveying from pulverizing mills, dust collectors, screws, separators, bins, and silos.

Perhaps all you need to reduce your material handling costs is a simple Airslide installation. Fuller will be glad to study your conveying problems and, where appropriate, offer cost-reducing recommendations . . . all without obligation.

Fuller Company is the exclusive manufacturer of air-gravity conveyors, except for use in motor vehicles, under Huron Portland Cement Company U. S. Patent Nos. 2, 316, 814, 2, 517, 837, 2, 527, 394, 2, 527, 455, 2, 527, 466, 2, 257, 499, 2, 589, 968, and Patents Pending.

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS •  
COMPRESSORS AND VACUUM PUMPS •  
FEEDERS AND ASSOCIATED EQUIPMENT

# Fuller

FULLER COMPANY, Catasauque, Pa.  
120 So. LaSalle St., Chicago 3  
420 Chancery Bldg., San Francisco 4

When inquiring check CP 8386 on handy form, pgs. 2-3

FH-30  
1673

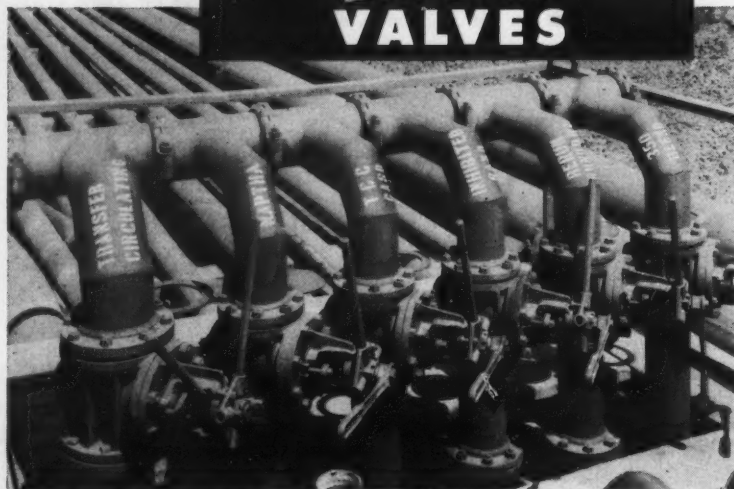


★ positive, DROP-TIGHT shut-off

★ instant STICK-PROOF operation

"built-in features of"

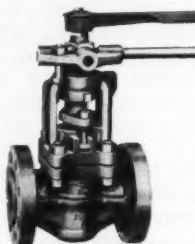
## HOMESTEAD *Lever-Seald* VALVES



Built right into every HOMESTEAD LEVER-SEALD VALVE is a powerful lever-and-screw device that either firmly seats the valve, or relieves seating pressure just enough to overcome friction and permit easy operation. For this reason, hard-to-hold fluids or extremes of temperature and pressure cannot cause a HOMESTEAD LEVER-SEALD VALVE to stick or "seize."

Instant, dependable operation, long service life, and extremely low maintenance cost are assured by this exclusive HOMESTEAD design. All vital operating parts and seating surfaces are protected from the corrosive or erosive effects of line fluids. No lubrication is required, but valve may be pressure gun lubricated if desired.

HOMESTEAD LEVER-SEALD VALVES are available in metals and alloys to specification; sizes 1½" to 12"; from vacuum to 1500 lbs.; temperatures from 40° below zero to 1100° F.



For complete details MAIL THE COUPON TODAY.

Without obligation, send me Catalog 39-3 covering Homestead Lever-Seald Valves.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_

**HOMESTEAD** VALVE MANUFACTURING COMPANY

*Serving Since 1892*

P. O. BOX 140

CORAOPOLIS, PA.

When inquiring check CP 8387 on handy form, pgs. 2-3

## MATERIAL HANDLING

**Quiet vibrators  
reduce noise  
in plant**

**Uses:** Designed to prevent packing of materials in bins, hoppers, trucks, railroad cars, or chutes.

**Features:** Units provide heavy impact for their weight and operate quietly. Reported impact force (60c current) of 160-lb unit is 1440 lb.

**Description:** Vibrators employ rotary-weight shaft principle of developing vibration. Working frequency of the units is 3600 impulses per minute. Choice of voltages include 110 to 550v, three-phase AC.

(Electric vibrators are a product of Cleveland Vibrator Co., Dept. CP, 2828 Clinton Ave., Cleveland, Ohio . . . or for more information check CP 8388 on handy form which is located between pages 2 and 3.)

**When lift truck operator  
leaves, brake goes on  
automatically . . .**

three minutes later, time delay relay shuts off engine

**Uses:** As a safety device for manufacturer's gasoline and diesel fork trucks.

**Features:** When operator leaves truck for any reason, driver's rise instantly causes parking brake to be applied. In addition, time delay relay permits engine to idle for three min before shutting it off automatically.

**Description:** Automatic braking device is available as optional equipment at slight additional cost on manufacturer's gasoline and diesel fork trucks. Idling feature gives operator time to make minor fork adjustments or to perform other activities and return to his seat without having to restart engine.

(Development of the Yale & Towne Mfg. Co., Materials Handling Div., Dept. CP, 11000 Roosevelt Blvd., Philadelphia, Pa. . . . or for more information check CP 8389 on the convenient Reader Service slip located between pages 2 and 3.)

## One-Man DRUM TRUCK



**Makes Loading  
And Unloading Of  
Drums Up To 1000  
Pounds Automatic**

Handling of drums and barrels becomes a cinch for one man with this Thomas Safety Drum Truck. Trucker never touches barrel—loading and unloading is automatic. Sliding 2-in-1 hook fits all wooden and metal barrels, cradles drum securely so it can't roll off. Available with chemical resistant tires. Order one on trial basis.

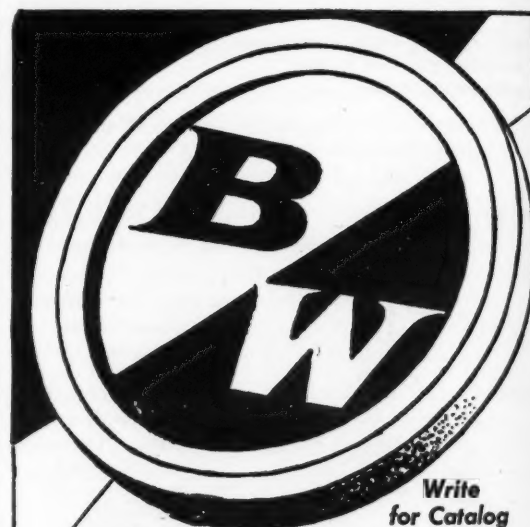
The No. 90 Thomas Drum & Barrel Truck shown above has a capacity of 1000 lbs., weighs 80 lbs.

**THOMAS**  
TRUCK & CASTER CO.  
416 Mississippi River  
Keokuk, Iowa



**Send**  
for free  
literature

When inquiring check CP 8390 on handy form, pgs. 2-3



Write  
for Catalog

**Floatless ALL ELECTRIC  
LIQUID LEVEL CONTROLS**

**FIRST and FOREMOST  
IN THE FLOATLESS  
CONTROL FIELD**

**B/W CONTROLLER  
CORPORATION**

2204 E. Maple Road  
Birmingham, Mich.

When inquiring check CP 8391 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## MATERIAL HANDLING

### Keeps materials, sheets apart for curing

**Uses:** For drying or curing sheets or material where separation must be maintained.

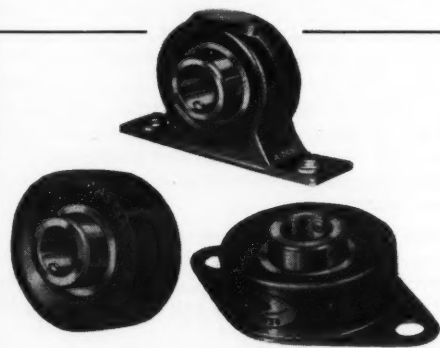
**Features:** Shelves can be raised or lowered easily and are automatically held in position by sturdy extension springs.

**Description:** Truck is constructed to fit user's requirements. Number of shelves, distances between shelves, and weight carrying requirements



are varied with specifications. Truck can be made for handling with lift truck or pushing by hand.

(Book Rack is a product of Palmer-Shile Co., Dept. CP, 16003 Fullerton, Detroit 27, Mich. . . . or for more information check CP 8392 on handy form, pages 2 and 3.)



For quieter operation, ball bearing units are built with rubber mountings and pressed steel frames. Pillow blocks, flange, and cartridge units come in six shaft sizes from 1/2 to 1". Oil resistant synthetic rubber mounting rings reduce noise and vibration on light duty applications. Bearing units are grounded to frame to drain off static.

(Rubber mounted bearings are products of Stephens-Adamson Mfg. Co., Dept. CP, 11 Ridgeway Ave., Aurora, Ill. . . . or for more information check CP 8393 on handy form, pages 2 and 3.)

# Marietta

GREATEST NAME IN SILOS

## 'WAY OUT IN FRONT.... in research and development

MARIETTA continues to set the pace by maintaining a continuous research-engineering program, with a foundation derived from years of design and construction experience.

This program has resulted in the development of modern, efficient storage systems complete with design adaptability for every industrial storage need . . . capable of economically storing and handling all bulk materials.

You can depend on a MARIETTA storage system to eliminate waste and spoilage . . . to improve handling facilities . . . to build reserves and to lower operating costs. MARIETTA, the greatest name in farm and industrial silos.

*Write for details today.  
Catalog upon request.*



A modern industrial storage system especially designed and erected by Marietta. Duquesne Light Co., Pittsburgh, Pa.



THE

# Marietta

## CONCRETE CORPORATION

MARIETTA, OHIO

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Hollywood, Florida  
Box 1575, Charlotte, N. C.

PRECAST CONCRETE PRODUCTS FOR FARM, HOME AND INDUSTRY

When inquiring check CP 8394 on handy form, pgs. 2-3





## Rugged NEW **SHOVELoader** mechanizes bulk handling for only \$3395.00\*

For LESS than \$10.00 a day for one year . . . much less than you pay a laborer with a hand shovel . . . you can own a Baker-Lull 12 cubic foot SHOVELoader. And you get a lot more for the money!

Check all of these features and see why this SHOVELoader compares with others costing \$350 to \$400 more. The lift height is a tall seven feet with lifting capacity a husky 1500 pounds . . . 500 pounds more than most competitive units. The loader arms are located out in front of the operator—not around him—to keep him safe from injury and give him clear-view visibility at all times. The bucket can be cradled low too, giving

him unobstructed forward visibility and making it unnecessary to drive backward as with other units. Maximum travel speed is 14 MPH. Plenty of bucket tilt back at ground level makes it easy to get a full bucket every time from stockpiles . . . letting you reduce handling costs by moving more bulk in a shorter time.

Attachments let you do more types of work too. Lift forks let you handle palletized loads, the crane hook gives you a portable hoist, and special buckets are available for handling dense materials. Exhaust-destroying catalytic equipment is also available for indoor use where necessary.

Baker-Lull SHOVELoaders are available in sizes ranging from 12 cubic feet to 1½ cubic yards four wheel drive. Should you desire information on other sizes please specify when writing. The BAKER-LULL Corporation, 315 West 90th Street, Minneapolis 20, Minn.

\*F.O.B. Minneapolis

THE BAKER-LULL CORPORATION,  
315 West 90th Street • Minneapolis 20, Minn.

Please send full information on the Baker-Lull, Model 20, 12 cu. ft. SHOVELoader which sells for only \$3395.00.

NAME.....  
COMPANY.....  
ADDRESS.....  
CITY..... STATE.....



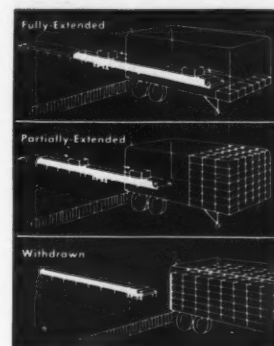
**SHOVELoader**

When inquiring check CP 8395 on handy form, pgs. 2-3

### MATERIAL HANDLING

**Conveyor extends and retracts — saves trips as truck trailers are loaded . . .**

self-contained motor drive with push button controls keeps unit next to worker

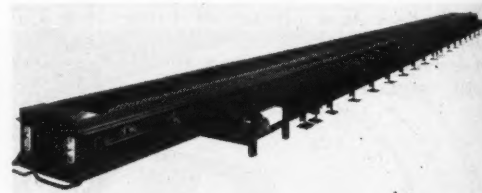


**Uses:** For loading or unloading packages from truck to plant. Can be used to bridge gap between truck and loading dock where railway tracks prevent truck from backing flush with platform.

**Features:** Safety guard bar protects operator from actual contact with end

of moving boom. When bar is depressed, boom stops.

**Description:** Equipment consists of self-contained power-driven boom conveyor, mounted in a stationary supported track structure. Moving element is supported by ball-bearing cross rollers. Unit is extended and retracted by means of push buttons located at head end of boom. Conveyor



Operates in forward or reverse by means of push button controls in head end

can operate in either direction. Two integral side chains maintain accurate alignment of woven wire belt moving element. Varying range of widths, lengths and elevations are available for the boom conveyors.

(Telescopic boom conveyors are a product of Alvey Conveyor Mfg. Co., Dept. CP, 9301 Olive Street Rd., St. Louis 24, Mo. . . or for more information check CP 8396 on handy form, pages two and three.)

**Takes bulk material from conveyors and tosses it into pile . . .**

no need for elaborate extension conveyors

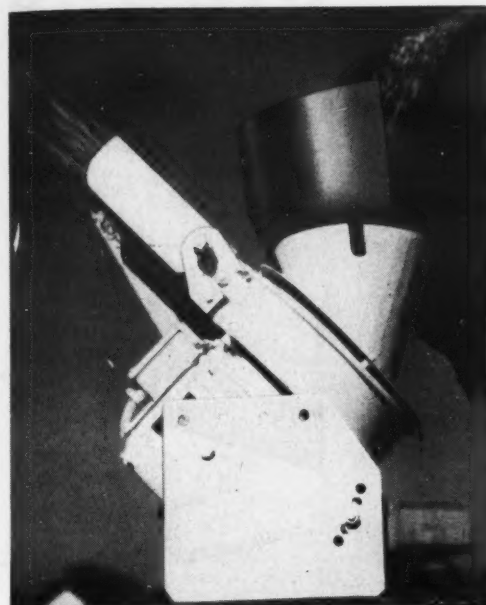
**Uses:** For loading box cars, bins or open area piles as well as unloading gondolas, trucks, and a variety of bins.

**Features:** Unit can be equipped for portability

CHEMICAL PROCESSING

with pneumatic tires, brakes and handle. Its 550-lb weight makes it possible to move the machine quickly and easily.

**Description:** Centrifugal-action, beltless piling machine takes bulk material discharge from belt conveyors and throws it into piles at rate of 40



Piles 40 tons of material per hour

or more tons per hour. Trajectory is regulated by an adjustable discharge chute. Receiving hopper will accommodate discharge from conveyor belts up to 30 inches wide.

Unit is direct motor driven with 3 hp motor and is available for 50 or 60 cycle, 2 or 3 phase 220, 380, 440 or 550 volt AC current.

(Model M Speedpiler is a product of the Pettibone Mulliken Corp., Dept. CP, 4700 W. Division St., Chicago 51, Ill. . . or for more information check CP 8397 on handy form, pages 2 and 3.)

#### Manlift elevators speed movement of personnel between floors

Illustrated eight-page bulletin presents complete line of manlift elevators which are used in multi-floor buildings where there is vertical processing of products. Units are adaptable to chemical plants, oil refineries, cement plants, milling installations, and similar industries. Elevators provide simultaneous up and down employee transportation with no waiting.

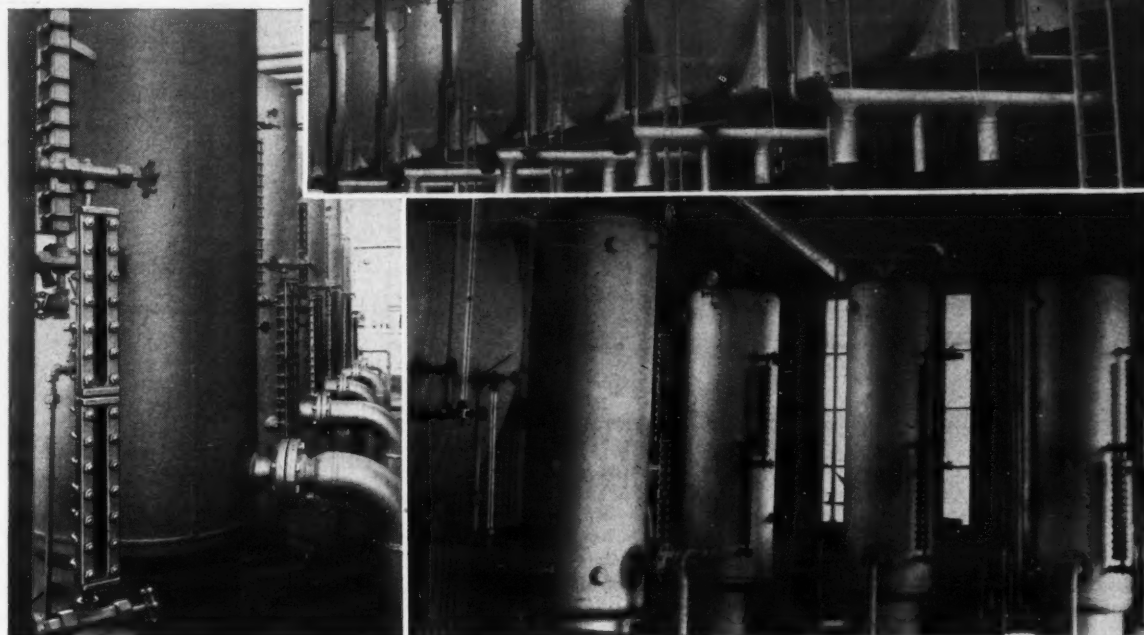
Bul HB-54 is issued by Humphrey Elevator Co., Inc., Dept. CP, 897 Division St., Faribault, Minn. When inquiring specify CP 8398 on handy form, pages 2 and 3.

# Things are getting tougher!

As temperatures and pressures go up...and corrosion becomes more of a problem...the equipment you use becomes more important. That's especially true for liquid level gages.

You can expect, and get, exceptional service from Penberthy gages and valves under increasingly severe conditions.

Our experience enables us to help you specify... or even design to your particular needs...gage sets which give accurate readings for long periods, efficiently and economically.



● To help you in specifying the right gages for your needs, write for Catalog 35. If your requirements are special, put our engineers to work on them.

#### PENBERTHY INJECTOR COMPANY

Division of the Buffalo-Eclipse Corporation  
1242 Holden Avenue • Detroit 2, Michigan

Established 1866

Penberthy gage sets are made from carbon, chrome-moly and stainless steel as well as Monel metal. They are also available in acid bronze, Everdur, nickel and Hastelloy. All materials conform to or exceed requirements for maximum recommended pressures and temperatures. The finished products are rigidly inspected and tested under actual working conditions.

And, only with Penberthy Gages, do you get such features as the "Floating Shank" which automatically compensates for as much as  $\frac{3}{8}$ " variation in center-to-center distance of the vessel tapping.

There's Certain satisfaction in PRODUCTS BY



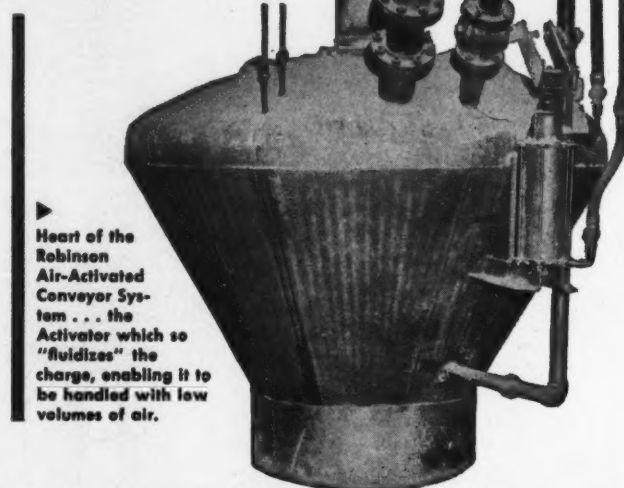
- CYCLING JET PUMPS
- EJECTORS
- INJECTORS
- ELECTRIC SUMP PUMPS
- EDUCTORS
- EXHAUSTERS
- SYPHONS

When inquiring check CP 8399 on handy form, pgs. 2-3



# Robinson *Air Activated* Conveyor

*The Low-volume Air Conveyor*



Heart of the Robinson Air-Activated Conveyor System . . . the Activator which so "fluidizes" the charge, enabling it to be handled with low volumes of air.

**Averages 1 Cubic Foot of Air per Pound of Materials Handled**

**R**ight here is one reason — and a stand-out reason — why the Robinson Air-Activated Conveyor is so economical in handling bulk dry-pulverized and fine-granular materials. Compressed air costs money so, if you can hold air costs down, as with the Robinson, you keep handling costs down. And no other power is necessary to operate a Robinson System.

The reason why the Robinson System can operate with such low air volume is due to the fluidized nature of the charge when transported through the pipes. Pressure alone will not suffice. It requires this Robinson Air-Activation or fluidizing effect. Material "flows" rather than blasts through.

Many Robinson Systems are in service handling a variety of products and in some cases are transporting them several thousand feet. This system may be just what you need for handling those dry, bulk materials in your plant. It has several outstanding features which we'll be glad to discuss at your convenience.

**ROBINSON**



A Division of  
Morse Boulger Destructor Co.

**CONVEYOR SYSTEMS**

211-V EAST 42nd ST. • NEW YORK 17, N. Y.

Representatives in Principal Cities

When inquiring check CP 8400 on handy form, pgs. 2-3

## MATERIAL HANDLING

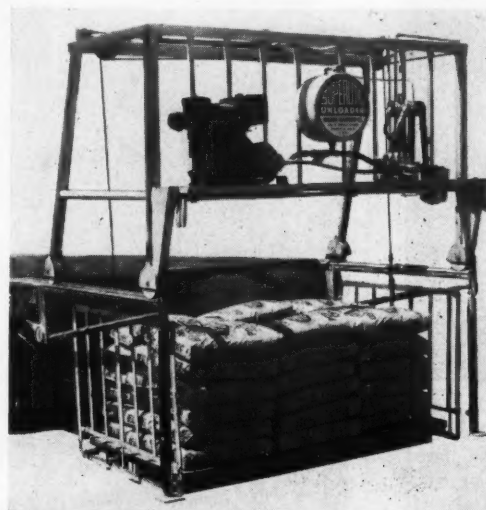
**Load, unload packaged goods from trucks in short order with hydraulic unloader . . .**

unit has capacity of 7000 lb, handles drums, barrels, boxes, and sacked materials

**Uses:** For rapid loading and unloading of materials from standard 8' wide flatbed truck or trailer.

**Features:** Carriage is hydraulically propelled through positive chain drive. Lifting and lowering mechanism is powered through hydraulic cylinder.

**Description:** Unit is equipped with 7½-hp gasoline engine. Loads up to 7000 lb may be



Unloader shown above fits any standard 8' wide flat-bed truck or trailer

handled. Overall dimensions are: 96" wide, 65½" high, and 70½" long. Inside dimensions between slings is 87". Net weight is 1480 lb.

(Superlite unloader is a product of Builders Equipment Co., Dept. CP, 4012 N. Central Ave., Phoenix, Ariz. . . or for more information check CP 8401 on handy form, pages 2 and 3.)

### Features of dual trough principle for conveyors outlined

Manufacturer's six-page illustrated bulletin describes new line of "Balanced, Dual Trough" vibrating conveyors and screens. Applications, low maintenance factor, power requirements, mounting, models and capacities, and specifications for tube models available are given in literature.

Bulletin on Balanced, Dual Trough Vibrating Conveyors is issued by Syntron Company, Dept. CP, 110 Lexington Ave., Homer City, Pa. When inquiring specify CP 8402 on pages 2 and 3.

ANOTHER **IBH** FIRST

**\*IN-BETWEEN HANDLING**

Short distance hydraulic manipulation of materials too heavy for manual handling yet not requiring high priced power driven equipment.

# BIG JOE

**TRIPLES THE ACTION!**



*Easier, Faster Unloading!*

In UNLOADING operations the ability to raise the forks or platform three times as fast and with one-third the effort is extremely important. All "BIG JOE" foot operated lift trucks are now equipped with the new, exclusive "triple action pump" which saves 21 foot strokes per 56" lift.

More than 40 "BIG JOE" models are specifically designed for IBH\* . . . a choice of foot and battery operated 6 and 12 volt system units . . . lever, push-button or throttle control . . . guaranteed for quality . . . "BIG JOE" offers FLEET OPERATION at the price of a single power-driven fork truck.

"HYDRAULIC HANDLING FOR EVERY DEPARTMENT"



Write for our booklet "IBH—The Economical In-Between System for Handling Materials"



**BIG JOE** Manufacturing Company  
906-12 Jackson Blvd., Chicago 7, Ill.

©1954 Big Joe Mfg. Co.

When inquiring check CP 8403 on handy form, pgs. 2-3

CHEMICAL PROCESSING

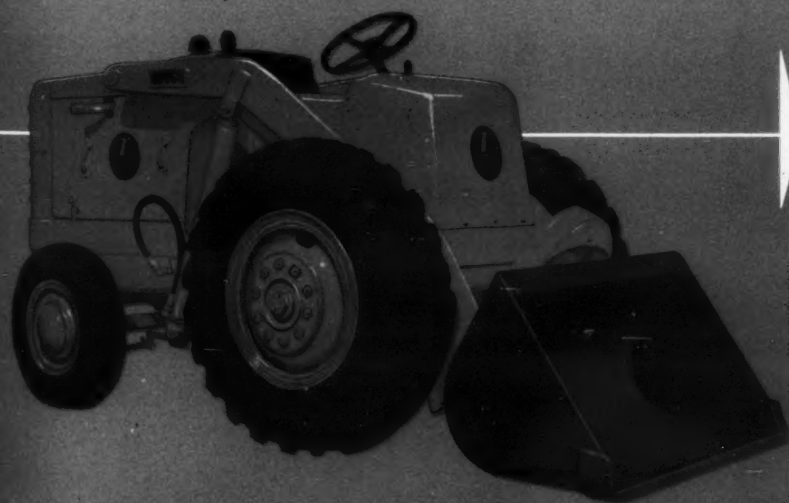
# NOW

GREATER OUTPUT FROM  
TWO FAMOUS **PAYLOADER** MODELS



# NEW..

TORQUE CONVERTER  
DRIVE ON MODEL HA  
12 CU. FT. CAPACITY  
(STRUCK-LOAD)  
16 CU. FT. CAPACITY  
(PAYLOAD)



# NEW..

TORQUE CONVERTER  
DRIVE ON MODEL HAH  
WITH POWER STEERING  
18 CU. FT. CAPACITY  
(STRUCK-LOAD)  
24 CU. FT. CAPACITY  
(PAYLOAD)

**Greater Output • Easier Handling • Lower Upkeep**

Details  
on other  
side



# NEW Torque Converter Drive Multiplies **PAYLOADER** Output

## FASTER OPERATION

Torque Converter automatically selects highest operating speed in relation to the load.

## INFINITE SPEEDS

4-speed transmission, plus Torque Converter, provides an infinite number of operating speeds.

## EASIER OPERATION

Torque Converter, by multiplying torque without changing gears, simplifies operators work.

## PRECISE CONTROL

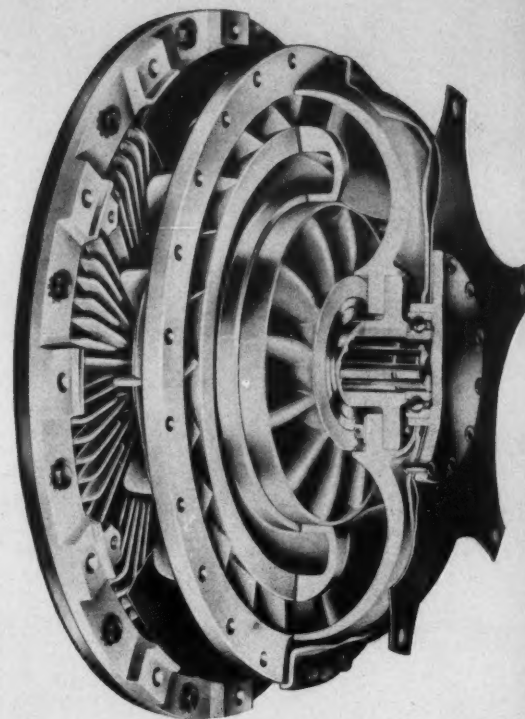
"Pinpoint" control for close maneuvering by accelerator only. Clutch slipping is eliminated.

## FULL ENGINE POWER

Engine operates at most efficient speed. Eliminates stalling and delays waiting for power pick-up.

## LOWER MAINTENANCE

Cushion of oil absorbs load shocks prolongs life of entire drive assembly. Less down-time results.



Heavy duty, precision-built combination torque converter—fluid coupling multiplies torque up to 2.1 times for starts and heavy loads...it is an efficient fluid coupling when loads are light.

WRITE for information regarding these new models, or any of the front-wheel, rear-wheel or four-wheel-drive models. Payload (heaped) capacities from ½ to 2 cubic yards.

**THE FRANK G. HOUGH CO.**

744 Sunnyside Ave., Libertyville, Illinois



# PAYLOADER®

THE FRANK G. HOUGH CO. • Since 1920



Few  
in co

Plow  
32" I  
swedg

Swee

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button  
steel  
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## MATERIAL HANDLING

### Few moving parts used in conveyor system

Plow steel cable cut in 16, 24 and 32" lengths with steel buttons swedged on both ends make up



Swedged-button ends of chain recessed in bracket

a "cable-link". The swedged-button ends recess in cavities of steel brackets which envelope ends of table-links. Steel nuts exert 360° pressure on cable retaining trolley assembly.

No moving parts below the rails plus 0.02 friction ratio give good service life. System comes in 3 models: light (using 2" tee rail or 6" junior I beam), medium (3" I beam), or heavy (4" I beam). Maximum suspended load capacities range from 80 to 500 lb per station and pull loads per drive from 1500 to 4000 lb.

(Cable-Links is a development of Cable-Link Corp., Dept. CP, 20175 John R St., Detroit 3, Mich. ... or check CP 8404, pgs. 2 & 3.)

For more information on product at left, specify CP 8405 ... see information request blank between pages 2 - 3.

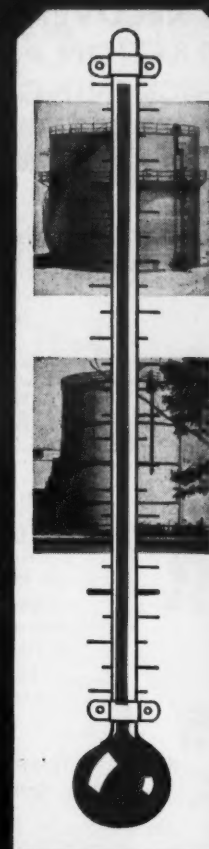
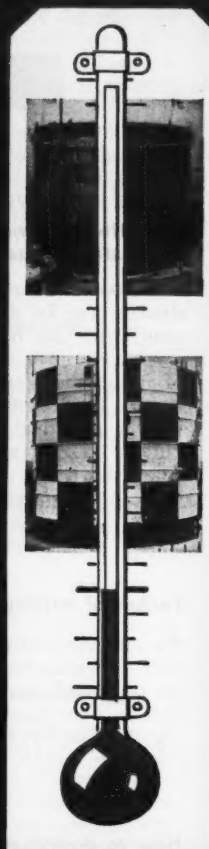
For more information on product at right, specify CP 8406 ... see information request blank between pages 2 - 3.

## from the ARCTIC to the TROPICS

more than

# 130

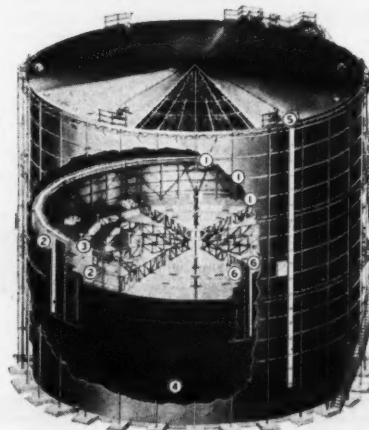
WIGGINS  
GASHOLDERS  
have eliminated  
operating costs  
for users of  
chemical process  
and industrial  
gases



This 100% dry seal gasholder (no water, no tar, no grease) has proved itself under every condition of climate and temperature. Because of the seal and the simple operating mechanism, operating costs have been entirely eliminated. Comparison of maintenance expense by owners of Wiggins gasholders also shows remarkable savings. Companies who have converted old-type gasholders to the Wiggins advantages have been able to enjoy similar savings. Write for information.

### PISTON RISES NEARLY TO TOP—MINIMUM OF WASTE SPACE CAN BE BUILT ANY SIZE • NO CONTAMINATION OF GAS

1. Space above piston completely ventilated
2. Wide clearances simplify operation.
3. Gas-tight frictionless seal not affected by weather.
4. Piston rests on bottom when empty—less than 1/2 of 1% dead space for purging.
5. Leveling device—dependent of side wall—keeps piston level.
6. Fenders prevent all tension in seal.



**General American Transportation Corporation**  
135 SOUTH LA SALLE STREET • CHICAGO 90, ILLINOIS

Offices in Principal Cities

Export Dept.: 380 Madison Avenue, New York 17, N. Y.  
Plants: Birmingham Ala. • East Chicago, Ind. • Sharon, Pa.  
In Canada: Toronto Iron Works, Ltd., Toronto, Ontario

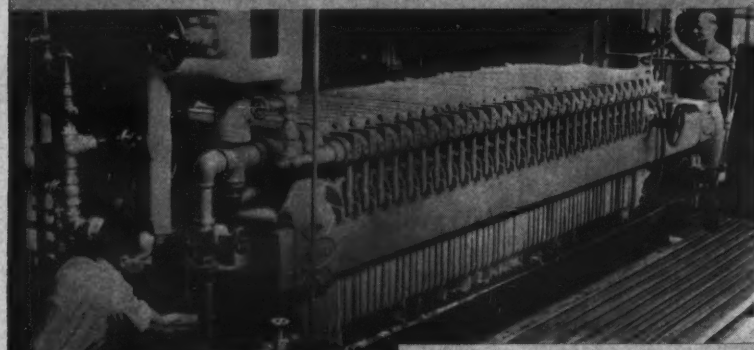
by  
**GENERAL  
AMERICAN**





# For ALL These Jobs -

**CLARIFICATION • RECOVERY OF SOLIDS  
WASHING - EXTRACTION - DRYING OF  
FILTER CAKE • THICKENING OF SLURRY**



*You Can't Beat*  
**SHRIVER  
FILTER  
PRESSES**

If you want to improve filtration quality and economy, plan on a Shriver Filter Press. No filter matches it for versatility, operating flexibility and assured production capacity under practically any conditions.

Thousands of processing plants use them, and continue to order new Shriver Filter Presses as process changes or expansions arise. There's a Shriver unit for every filtration need... from laboratory to large-scale operation.

- LOW FIRST COST**  
Filtering capacity at low cost per square foot of filtering area.
- LOW OPERATING COST**  
Easy to operate. No complicated moving parts. Minimum plant space.
- PERMANENT VALUE**  
Long service life. Low depreciation. High resale value.
- ANY TEMPERATURE • PRESSURE**  
Operate to 1000 p.s.i. at high or low temperatures.
- ANY CAPACITY**  
From a few gallons to more than 10,000 g.p.h. Stationary or portable units.
- CORROSION-RESISTANT**  
Made of any required metal, wood, rubber, plastics or coated metal.
- USE ALL FILTER MEDIA**  
Cotton, synthetic fiber, asbestos, glass, wire mesh, filter paper, etc., and any filter aids.

**This Book  
Proves It  
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**T. Shriver & Company, Inc.**

Filter Presses • Filter Media • Diaphragm Pumps

846 Hamilton Street • Harrison, N. J.

Sales Representatives	The Merrill-Brose Co. 2792 Cypress St. Oakland 7, Calif.	Process Eng. & Equip't. Co. 331 Thornton Ave. St. Louis 19, Mo.	Richardson Agencies, Ltd. Toronto, Ont. Montreal, Que.
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When inquiring check CP 8407 on handy form, pgs. 2-3

# briefs

from contemporary publications

## Quantitative analysis of harvested tobacco

For harvested tobacco leaves, all known constituents can be determined and unknown constituents can be classified by means of a procedure that involves step-wise removal of nitrogenous fractions from aqueous extracts. A Beckman spectrophotometer is used in a method that may be equally applicable to other plant materials. Fourteen pages, 16 tables, 5 figures, 79 references. ("Analytical Chemistry," Dec. '53, p. 1784.)

## Technical writing for engineers

Six common errors made by chemical engineers in writing technical reports and papers are illustrated, analyzed, discussed, and corrected. Four pages. ("Chemical Engineering Progress," Feb. 1954, page 104.)

## How to design stripping columns

The design of strippers for control of flash point, viscosity, and specific gravity of petroleum fractions is covered in nine fully illustrated steps. Attention is given steam requirement and number of stages. Three pages, 6 tables, 5 figures, 6 references. ("Petroleum Refiner," Feb. 1954, page 96.)

## Silene EF as a paper pigment

Silene EF, a precipitated, alkaline, hydrated calcium silicate of fine particle size, long used to reinforce rubber, improves tear, Mullen strength, opacity, brightness, smoothness, and printability when employed as a filter in writing, book, and board papers. Four pages, 5 figures. ("Paper Trade Journal," Feb. 26, 1954, page 53.)

## Vitamin B<sub>12</sub> as supplement to animal feed

Although purified vitamin B<sub>12</sub>, which sold at \$60,000 per pound in 1952, combats pernicious anemia in human beings, the

most extensive application is now as an additive to animal feeds where only a few milligrams per ton are required. Methods of production as carried out in Newaygo, Michigan are described. Six pages, one flowsheet, one figure, one table, 8 photographs. ("Industrial and Engineering Chemistry," Feb. 1954, page 238.)

## Test for broaching titanium and alloys of titanium

Results of a study of broach performance in connection with high-speed-steel tools, relief and rake angles, chip formation, rise per tooth, surface finishes, and unit horsepower values are reported. Seven pages, 17 figures, 4 tables. ("Mechanical Engineering," Jan. 1954, page 8.)

## Practical tips on conveyor belting

Methods of splicing, loading, and repairing conveyor belts are supplemented by tips on how to keep belts running straight and how to reduce wear. Manufacturers' recommendations are digested. Eleven pages, 2 tables, 13 figures, 7 photographs. ("Foundry," Feb. 1954, page 86.)

## New uses for compressed air

Applications of compressed air in operating safety devices and labor-saving tools, in controlling processes, and in handling products are given. Specifications of suitable compressors are included. Three pages, 5 photographs. ("Power," Feb. 1954, p. 94.)

## Quality control

This presentation illustrates the stake that management, production, assembling, planning, cost estimating, advertising, and sales departments have in an adequate system of quality control. Figures depict frequency distribution and sampling tables for a typical application. Three pages, 1 photo, 3 figures. ("Steel," Jan. 11, 1954, page 54.)

## How to catalyze

Pertinent production with collaborative automatic Consider reactor a operating and corn is includ ("Petrole

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#### How to evaluate cracking catalysts

Pertinent to catalytic cracking for the production of gasoline, this discussion deals with collection of performance data for an automatic fluidized, fixed-bed, aging unit. Consideration of charge pumps, preheaters, reactor assemblies, preparation of catalyst, operating procedure, laboratory analyses, and correlation with commercial operation is included. Four pages, 1 figure, 3 photos. ("Petroleum Processing," Dec. '53 p. 1875.)

#### Maintenance for cooling towers

Studies of deterioration of redwood, fir, pine, and cedar commonly used for cooling towers are covered under the headings of chemistry of wood, time factors, and biological and non-biological internal and surface attack. Five pages, 15 photos. ("Power," Feb. 1954, page 117.)

#### Wood as technical raw material

Although traditionally handicapped, the wood utilization industry can take advantage of fluidizing techniques in the destructive distillation of wood, of hydrogenation of lignin, and of fermentation of hydrolyzed wood. Greater expenditures for fundamental and applied research are needed. Three pages. ("Paper Industry," Jan. 1954, page 1115.)

#### Amine film reduces corrosion by condensate

An impervious, monomolecular, nonwetttable film of octadecylamine protects pipe lines and minimizes corrosion by reducing the alkalinity of boiler feed water. Commercial applications are covered. Four pages, 2 tables, 4 figures, 4 references. ("Combustion," Jan. 1954, page 55.)

#### Application of flow tubes

For measurement of rates of flow, the advantages of symmetrical flow tubes, which yield high pressure differentials with low throat contractions and head losses, are discussed. Applications are in the metering of water, sewage, steam, gas, and chemicals. Two pages, 2 figures. ("Instruments," Dec. 1953, page 1879.)

#### How to join sewer pipe

Joints for sewer pipe can be described as hot-poured asphalt, filled plasticized sulfur composition, filled coal tar pitch, hot-poured filled plastic, precast asphalt, neat cement, ready-mixed trowelable composition, on-the-job troweling composition, chemical resistant, and vinyl plastisol straight end. Eight pages, 5 photographs. ("Sewage and Industrial Wastes," Nov. 1953, page 1289)

#### Economic evaluations applied to chemical industries

In the chemical industry, economic analyses provide guidance in the fields of cost control, research and development, pricing, and capital expenditures. Applications to manufacturing, packaging, and sales costs are discussed. Various criteria for measuring economic appeal are given. 3 pages, 3 figures. ("Petroleum Refiner," Oct. 1953, page 107.)

#### What's ahead for synthetic rubber

In this survey of plans for research in and development of synthetic rubber, coverage includes the responsibilities of Government and private interests, and suggestions that the Government Laboratories, now operated by the University of Akron, be sponsored by the National Science Foundation and that an American Rubber Institute be established. Four pages. ("India Rubber World," Dec. 1953, page 345.)

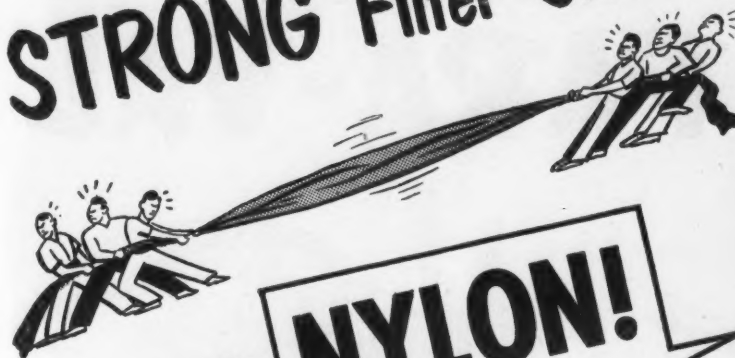
#### How errors in measurements affect performance tests

The manner in which errors in measuring rate of flow, pressure, temperature, electrical power, speed, and composition of stack-gas affect tests on turbines, steam generators, condensers, pumps, fans, and heat exchangers is discussed in detail. Six pages, 4 tables. ("Combustion," Feb. 1954, page 49.)

#### Drying rates of paper and board

As applied to glassine, writing, tissue, absorbent, kraft, chip, and book papers, a TAPPI research grant results in data on variation of drying rates on the paper machine. Fourteen pages, 2 tables, 8 figures. ("Tappi," Jan. 1954, page 1.)

# Need a STRONG Filter Cloth?



You NEED

NYLON!

**NYLON**, you know, has the highest tensile strength of all fibers — natural and synthetic — and keeps this strength under severe working conditions. And, NYLON is outstandingly resistant to flex and abrasion wear, which makes for strong, long-lasting fabrics. NYLON is outstanding in many other ways, too. Check these NYLON advantages.

**Highly resistant** — to most common alkalis, common organic acids, many other chemicals.

**Stands up well** — under heat: maximum working temp. 250°F., outshines all other synthetics in the 200-250° range.

**Unaffected** — by fungi, molds and bacteria. Where contamination is a factor, such as in filtering food products, pharmaceuticals, etc., NYLON may be steam sterilized, making it ideal for the job.

**Promotes** — easy cake discharge because NYLON offers a smooth non-clinging surface.

We can supply you with NYLON filter cloth in many weaves, in many widths, in roll lengths or less, or as prepared filter element covers sewed with NYLON thread.

Write us for test samples — when you do, tell us about your filtering problem.

... for your Filter Paper requirements try NETONE Filter Paper. High tensile strength, high burst factor, abrasion resistant, crease resistant and chemical resistant. Send for a test sample.

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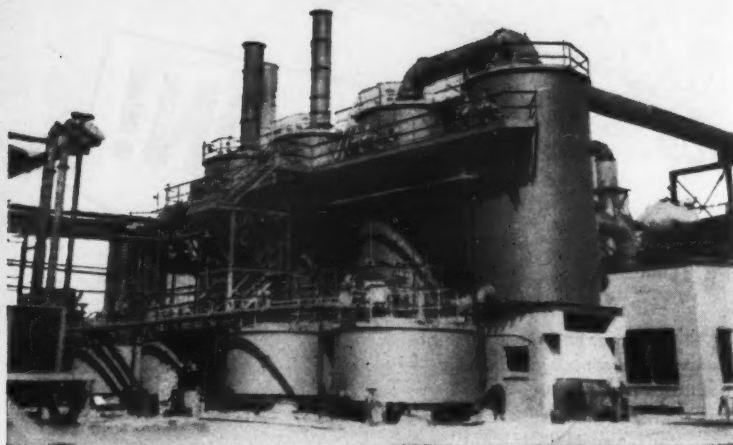
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**because PARA-VAL provides  
SUPERIOR RESISTANCE  
to Acids and Alkalies!**

- ★ Not ONE saponifiable ingredient
- ★ Made with Chlorinated Rubber
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- ★ Gives added film thickness
- ★ Easy to apply

If you'd like to know more about Para-Val and other items in Valdura's complete line of specialized maintenance products, or if you'd like help with a particular problem, just state your wishes on your regular letter-head and mail to the address below. Your inquiry will be treated as an invitation to provide service . . . not as a license to exert selling pressure!



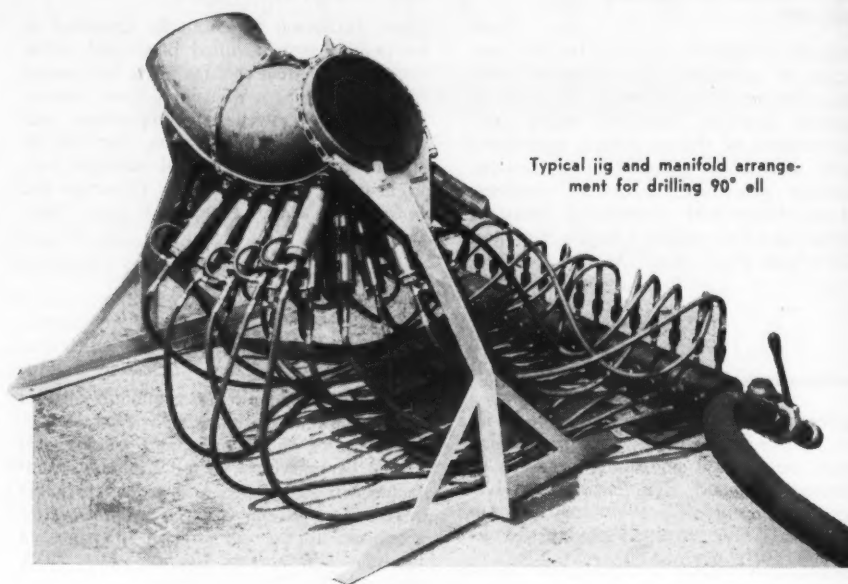
**VALDURA HEAVY DUTY PAINT DIVISION**

**AMERICAN-MARIETTA CO.**

101 E. Ontario St., Chicago 11, Ill.

When inquiring check CP 8409 on handy form, pgs. 2-3

## corrosion control



Typical jig and manifold arrangement for drilling 90° ell

Du Pont develops unit that —

**reduces cost of drilling "weep" holes**

**Multiple drill lowers cost per hole to \$0.016 in comparison with \$0.342 for former method**

**Problem:** To fulfill an AEC contract calling for a large number of minimum-thickness "weep" holes in pipe elbows, engineers at E. I. du Pont de Nemours & Co., Inc., found it imperative to develop a rapid, economical means of drilling. Previous procedure employed for drilling the holes (used to detect impending equipment or line failure due to corrosion) was to lay out the pattern, prick-punch points, and drill by hand using a collar on the drill as a stop or depth gage. In some cases paper templates were used to simplify layout procedure, but a considerable amount of time was required for the steps involved.

To meet this new problem, study indicated that jigs, fixtures, and methods should be developed to: 1) simplify pattern layout and facilitate drilling, and 2) permit multiple drilling of holes to reduce drilling time.

**Solution:** It was found necessary to design and fabricate a drill head with feed mechanism for this particular purpose. An air-actuated drill motor rated at 2800 rpm was utilized in combination with a specially designed air feed mechanism. A cylinder was fabricated to contain this air motor, which functions as a piston.

Rate of feed can be increased or decreased by changing diameter of hole in wall of drill-pressure piston, which results in change of end surface area. A spring is designed to return air motor to initial position and to retract twist drill. Length of stroke or depth of penetration by drill is limited by a plug sliding in slotted section of cylinder.

To compensate for various lengths of twist drills, nose piece can be extended or retracted and locked. This adjustable feature permits replacement of drills without resetting depth and stroke controls. It is only necessary to set nose piece flush with point of drills when replacement is necessary.

Exhaust air from motor is utilized to remove drillings and chips. This is accomplished by removing air motor vent cover

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MAY,

and discharging air through 3/16" diameter holes in nose piece.

In order to adapt unit for multiple drilling jigs, nose piece includes a bayonet lock, which is engaged to threaded bushings located in jigs. This facilitates replacement of twist drills when heads are being used for multiple drilling. A handle is provided for heads used for in-place drilling.

When using heads for multiple drilling, an air manifold is required for effective operation. Drill heads are connected to manifold with speed couplers, as shown in Fig. 1. This photo also shows a typical jig and manifold arrangement for drilling a 90° ell.

**Results:** Experience to date has established a unit cost of \$.0162 per hole through use of multiple drilling techniques. As a comparison, actual cost of hand drilling at one location was \$.342 per hole drilled.



When multiple jigs are not warranted, hand drilling using light templates is employed

In cases where the number of fittings or the size of pipe does not warrant use of multiple jigs, improved drill head offers advantages for single hole hand operation. These include depth control within drill head, reduced drill breakage, faster drill feeding, elimination of drill slip page.

(Prepared from information submitted by F. D. Lowther and H. R. Osmick, Engineering Dept., E. I. du Pont de Nemours & Company, Inc., Dept. CP, Wilmington 98, Del. Developments described were accomplished during work under Contract No. AT(07-2)-1 with the Atomic Energy Commission, whose permission to publish the article is gratefully acknowledged.)

If you're after a coating or special material to solve a corrosion problem . . .

try looking in the alphabetical Product Directory on page 213 to 216. Your Editors started this service many years ago, to make it easy for you to locate your interests in each issue.

## The Answer to your toughest tank lining problems



# TYGON

*flexible — plastic*

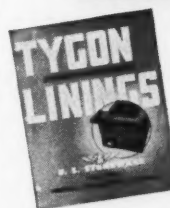
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**TOPS IN  
CORROSION-RESISTANCE**

**P**ROVEN in hundreds of the toughest possible applications during the past fourteen years, flexible Tygon plastic linings offer more value today than ever before.

Greater toughness — more stability — even longer life. These improved performance characteristics stem from improved manufacturing techniques, resulting in a denser, more homogeneous body. Top quality yesterday, Tygon is an even better material today.

And along with improved quality — application methods have been simplified. Application is no longer a "factory" must. Strategically located Tygon licensed applicators can now install Tygon linings quickly and economically. Coupled with lower applied costs are important savings in freight costs — and vitally important savings in time.

For that next "tough" tank lining problem — ask for, insist on — Tygon.



This new booklet tells the "down-to-earth" facts about Tygon. Where and how to use it. When not to use it. A valuable reference for every engineer faced with corrosion problems. Free on request. Write for your copy today!  
Address: Plastics & Synthetics Division, The U. S. Stoneware Co., Akron 9, Ohio.



**U. S. STONWARE**  
AKRON, OHIO

When inquiring check CP 8410 on handy form, pgs. 2-3



**Tests show silver and tantalum most resistant to 85%  $H_3PO_4$  at 250°C . . .**

copper observed to have appreciable resistance to attack at high temperatures

In tests of a number of metals conducted by Shell Development Company, silver and tantalum were found to be most resistant to 85% phosphoric acid at 250°C. A moderate attack on copper was also observed.

Copper was appreciably more resistant to attack in phosphoric acid at high temperatures than alloys such as Type 316 stainless steel, which normally would be the more resistant material at ordinary temperatures. Results of tests are summarized as follows:

Corrosion rate in mils per year	
85% phosphoric acid	
Silver	7
Tantalum	20
Copper	58
Nickel	1200
Monel	1100
Lead	5600
Type 317 SS	4300

**Conditions:**

0.5" diam x 8" long sealed Pyrex tubes.

10 ml of cp phosphoric acid solution

Single test specimen 0.1 x 0.25 x 2" ground surface totally immersed per tube

Tube evacuated at room temperature before sealing. No agitation, 250°C, one day.

In subsequent tests in pilot plant equipment and using turbulent acid, somewhat higher rates were observed with copper. However, copper specimens protected from rapid acid flow rate were attacked at the lower rates observed in tube tests. Silver also was attacked at a higher rate under turbulent flow conditions.

(Information on silver and tantalum obtained from technical paper, "Corrosion by Acids at High Temperatures", by R. F. Miller, R. S. Treseder and Aaron Wachter, of Shell Development Company, Emeryville, California. Paper was published in *Corrosion*, Volume 10, Number 1, January, 1954, page 7.)

**Wear, heat, corrosion resistance furnished by hard faced seat rings . . .**

increases load carrying capacity and life of equipment

**Uses:** Applications include all forms of poppet valve seating requirements as found in high pressure industrial and blow-off valves, internal combustion engines, and steam valves.

**Features:** Excellent wear, heat, and corrosion resistance is furnished by overlay which is of uniform hardness.

# Service dictionary for ALCOA ALUMINUM

Because of its long service life and low initial cost, ALCOA Aluminum has become one of the most popular metals in the chemical industries. Perhaps this service dictionary will help show why . . . and suggest some uses that can mean less down time, improved operations and greater savings in your business.

## Acetic and other Aliphatic Acids

ALCOA Aluminum used in equipment producing glacial acetic acid has a service record as long as 17 years. Propionic and butyric acids as well as several of the higher molecular weight acids (fatty acids) also are processed, stored, and shipped in aluminum equipment.

## Air and Gas Coolers

Aluminum heat exchanger tubes have been used successfully in air compressor intercoolers and aftercoolers. In one specific intercooler installation, aluminum tubes are still in service after more than 16 years with no significant corrosion being apparent. Alcoa Aluminum tubes are considered ideal for intercoolers handling natural gas, hydrogen sulfide, carbon dioxide, and many other gases.

## Ammonia

ALCOA Aluminum heat exchanger tubes have given up to 15 years continuous service handling mixtures of ammonia gas, carbon dioxide, and water vapor in soda ash plants. More than 12 years of service have been experienced in the use of aluminum tubes in ammonia dephlegmators and condensers. Aluminum storage tanks, piping, and bubble cap towers for ammonia recovery are now in service.

## Ammonium Nitrate

Ammonium nitrate and its aqueous solutions are handled extensively in aluminum. Aluminum evaporators, crystallizers, condensers,

screens, piping, pumps, tankage, and prilling towers are in use. Aluminum pressure vessels, piping, and tank cars are also used to handle ammonium nitrate fertilizer solutions.

## Food and Drug Processing

ALCOA Aluminum has been used in these processes for over 30 years. Nontoxic to living organisms, aluminum successfully handles Chloromycetin, citric acid, gluconic acid, oxogluconic acid, calcium gluconate, dextro-lactic acid, Penicillin, Streptomycin, sorbose, and riboflavin.

## Formaldehyde

Several ALCOA Aluminum condenser installations with excellent service records (some as long as 12 years) are in operation handling formaldehyde. Aluminum distillation towers, storage tanks, piping, heat exchangers, shipping drums, and tank cars also are in this service.

## Hydrocyanic Acid

Aluminum process equipment for handling hydrocyanic acid includes distillation towers, absorption towers, heat exchangers, condensers, tankage, piping, and shipping drums.

## Naval Stores

Naval stores—turpentine, rosin, copal, pentene, dipentene, and pinene—are widely handled in aluminum equipment. Aluminum resin kettles, evaporators, condensers, storage tanks,

transfer and shipping over 20 years

## Oxygen

Aluminum materials plants. Its stantially no loss in this field a trays and separators changers, exchanger teristics.

## Petroleum Products

Aluminum oils have years in less than exchanger than 18 years Aluminum service of handling sour crud cost couple corrosion lished its

## Refrigeration

In addition

## Helpful Aluminum

Call your write for

ALUMINUM CO

ALCOA ALUMINUM

ALUMINUM C

# ALUMINUM in the chemical industries

transfer lines, distillation equipment, piping, and shipping drums have been in service for over 20 years.

## Oxygen

Aluminum is one of the most economical materials of construction for tonnage oxygen plants. Its mechanical properties increase substantially with decreasing temperature with no loss in ductility. Among its applications in this field are low pressure fractionating towers, trays and bubble caps, reboilers, acetylene separators, piping, conventional heat exchangers, and unique gas-to-gas reversing exchangers with very high transfer characteristics.

## Petroleum Products

Aluminum storage tank roofs for sour crude oils have been in service for more than 20 years in locations where steel roofs failed in less than 5 years. ALCOA Aluminum heat exchanger tubes have been used for more than 18 years handling sour gasoline stocks. Aluminum bubble cap towers have given service of 10-15 years in debutanizer columns handling gasoline distillate from West Texas sour crudes at 200-425°F. Aluminum's low cost coupled with its remarkable resistance to corrosion by sulfur compounds has established its use in this industry.

## Refrigeration

In addition to the inorganic refrigerants,

## Helpful ALCOA Booklets

Call your nearest Alcoa sales office or write for any of these free booklets:

ammonia and sulfur dioxide, several halogenated organic compounds are used in aluminum refrigeration equipment. Of these, the Freons have proved very satisfactory for use in aluminum.

## Soaps & Cosmetics

For nearly 25 years ALCOA Aluminum has been in continuous service handling fatty acids in storage tanks, condensers, piping, and tank cars. Aluminum protects the stability and color of essential oils, edible oils and fats and glycerine . . . effecting trouble-free service and yielding a higher quality product.

## Solvents & Oils

Oils from animal and vegetable sources have negligible action on aluminum. Thus, lard oil, castor oil, cottonseed oil, peanut oil, olive oil, and palm oil are processed in aluminum. Aluminum piping, tubing, and process equipment are also used to handle solvents such as naphtha, benzene, diethyl ether, and others.

## Sulphur

One important factor favoring aluminum's use in the chemical and petroleum industries is its high resistance to corrosion by sulphur and sulphur compounds, notably hydrogen sulfide, one of the greatest sources of corrosion in the petroleum field. Sulphur vats, forms, piping, conveyors, hopper cars, and structures of ALCOA Aluminum are used to handle the elemental sulphur.

*Alcoa Aluminum in the Process Industries*  
*Alcoa Aluminum Heat Exchanger Tubes*  
*Alcoa Aluminum Pipe and Fittings*  
*Alcoa Utilitube*

ALUMINUM COMPANY OF AMERICA, 902-E Alcoa Building, Pittsburgh 19, Pa.

**ALCOA**  
**ALUMINUM**

ALUMINUM COMPANY OF AMERICA

When inquiring check CP 8411 on handy form, pgs. 2-3

## CORROSION



Depth of hard facing is determined by size of ring

**Description:** Seat rings are made from carbon, stainless, or tungsten die steels and hard faced at points of wear and impact with stellite overlays. Depth of hard facing alloy is determined by size of ring and will vary from .060 to .090".

(Seat rings are product of Cleveland Hard Facing Co. Inc., Dept. CP, 3047 Stillson Ave., Cleveland 5, Ohio . . . or for more information check CP 8412 on handy form, pages 2 and 3.)

## Life of trailers hauling corrosives extended by plastic panels for roofs and sides . . .

translucent material provides weight advantage of up to 1000 pounds

Service reports indicate that the life of trailers hauling corrosives has been considerably extended by the use of reinforced plastic for roofs and side panels. Plastic panels are molded from fibrous glass and a polyester resin known as Vibrin.

Plastic is so light that it gives trailer operators a weight advantage of up to 1000 pounds. Unpigmented plastic lets enough light into the trailer to read shipping labels and thus speed up loading.

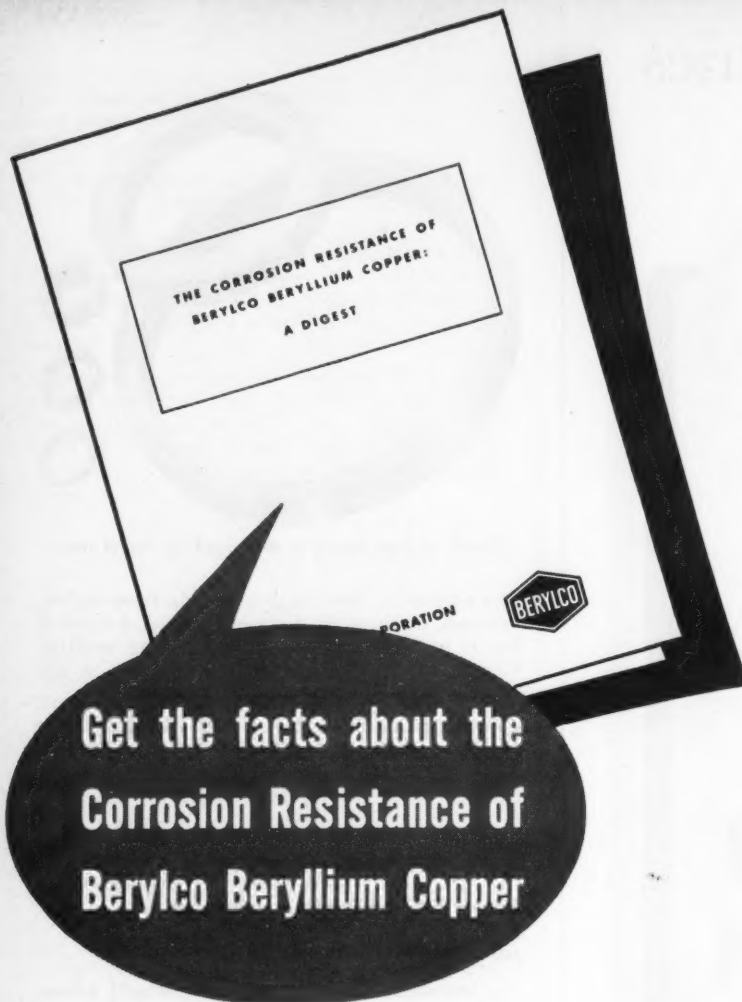
Reinforced plastic is also being used for interior liners in refrigerated trailers. Material withstands the abuse of loading and unloading. It does not rot or become contaminated and will not swell under steam cleaning.

Insulated trailers are being equipped with molded plastic doors and door frames. Doors are strong, warp-proof, and maintain their tight fit for life of trailer.

(Trailers in which reinforced plastic is used as structural material, are being manufactured by the Strick Co. of Philadelphia, Pa.)

(Vibrin polyester resin is product of Naugatuck Chemical Div., United States Rubber Co., Dept. CP, Rockefeller Center, New York 20, N. Y. . . . check CP 8413 on handy form, pages 2 and 3.)





This 4-page folder is a useful guide to the performance of beryllium copper alloys when exposed to a wide number of specific media. Send for your free copy today.

In general, Berylco resembles other high-copper alloys in resistance to corrosion. It has good resistance to marine and industrial atmospheres, fresh and salt water, most alkaline solutions, and some acids. It is not subject to season cracking or corrosion fatigue. It can be plated without danger of hydrogen embrittlement.

*Why is Berylco selected over other materials of comparable corrosion resistance?* Berylco beryllium copper parts are stronger, wear better, have greater resistance to moderately elevated temperatures than other copper-base alloys; also they gain in strength, ductility and impact resistance at subzero temperatures. Berylco is an age-hardening alloy, can be easily worked while soft, then hardened by a simple low-temperature heat treatment for maximum strength, wear resistance and conductivity.

Berylco beryllium copper alloys are available in a number of wrought forms or as casting ingots for immediate delivery



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When inquiring check CP 8414 on handy form, pgs. 2-3

## CORROSION

**Alkalis up to 190°F  
resisted by epon  
coating . . .**

also withstands solvents and dilute acids

**Uses:** As a protective coating for ducts, machinery, bottle washing and filling equipment, vessels, walls, and tanks. According to manufacturer, it can also be used as a replacement for baked coatings where heat cannot be applied.

Coating can be used to combat corrosion where alkali cleaners, soaps, and other chemical reagents are used. It can be used as abrasion-resistant coating where hardness and wear are factors.

**Features:** Material gives protection against alkalis in almost any concentration in immersion up to 180°F, and much higher temperatures when subjected to dry heat and fumes. It shows good resistance, when properly cured, to ketones, aromatics, and aliphatic solvents. Fairly good resistance is provided to dilute acids resulting from spillage and fumes.

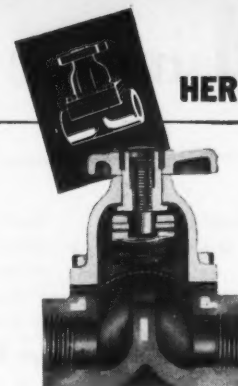
**Description:** Nerva-Kote Tac is catalyzed epon room-temperature-curing coating. Company is said to have developed a method of non-migrating plasticization of the film, which prevents brittleness in film due to aging. Several types of surface active agents have been added to give film a greater degree of resistance of chemical agents.

(Coating is product of Nerva-Kote Div., Rubber & Plastic Compound Co., Inc., Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. . . or for more information check CP 8415, pages 2 and 3.)

### Neoprene-sprayed coatings and sheet linings shown

Single sheet bulletin outlines protective qualities of Neoprene in applications affected by sunlight, heat, abrasion, oil, cold, and various chemicals. Table on organic chemicals for which Neoprene-lined tanks and piping can be recommended is included.

"Neoprene" is issued by Metalweld, Inc., Dept. CP, Scotts Lane and Abbottsford Ave., Philadelphia, Pa. Specify CP 8416, pages 2 and 3.



HERE'S *the* VALVE

for all-plastic  
piping systems

Choice of non-toxic, odorless, non-contaminating Ace Parian (polyethylene) or Ace Saran . . . handles most corrosive chemicals and ingredients. Diaphragm is rubber, neoprene or polyethylene. Bonnet assembly sealed from solution. Can be serviced without removing from line. Hills-McCanna, Saunders principle. All sizes 1/2" to 2", for 50 psi. at 77 deg. F. Ace also offers eight types of plastic and rubber pipe, many valves, pumps, etc.; write today.

**ACE rubber and plastic**

**processing equipment • SINCE 1852**

AMERICAN HARD RUBBER COMPANY, 93 Worth St., New York 13, N. Y.

When inquiring check CP 8417 on handy form, pgs. 2-3

turn  
to  
page 213 . . .

. . . for alphabetical index of all processes,  
materials, services, and equipment

discussed in this issue's editorial columns  
and advertisements, turn to page 213.

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was a feature in *CHEMICAL PROCESSING*  
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what you want . . . in a hurry!

CHEMICAL PROCESSING

119





Well worth noting:

## Use a FLINTKOTE Coating for years of heavy-duty protection

Flintkote makes you a *complete line* of spray, brush or trowel applied coatings for water, dampness and corrosion control . . . each designed for *specific* protection requirements, inside and out.

One of these products, and a good name to remember, is Flintkote HYDRALT® . . . multi-purpose industrial asphalt emulsion coatings, fibrated and non-fibrated.

HYDRALT Protective Coatings are unique mineral colloid asphalt emulsions which provide a durable, thick film *reinforced within itself*. Will not sag, flow or crack. Cold-applied over metal, masonry and insulation materials.

Is resistance to oil, grease and other petroleum products a problem? Then use Flintkote ORTAR† Emulsion Coating, a coal tar product.

You'll find complete details about all Flintkote protective coatings in Sweet's Catalog. Or write us.

† Trade-mark of The Flintkote Company

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experience

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phone, mail or personal  
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THE FLINTKOTE COMPANY, Industrial Products Division, 30 Rockefeller Plaza, New York 20, N. Y.; 55th & Alameda Sts., Los Angeles, Calif.

The Flintkote Company of Canada, Ltd., 30th Street, Long Branch, Toronto, Canada

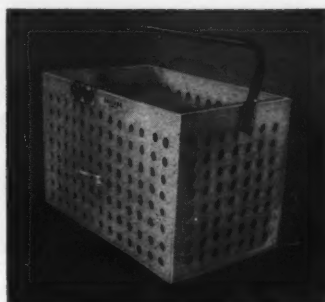
## CORROSION

**Acids and alkalis at 160°F withstood by polyethylene dipping basket . . .**

unit is light in weight, and unbreakable

**Uses:** For use in the metal cleaning, plating, chemical and allied industries.

**Features:** Polyethylene used for fabrication of basket is inert to chemical attack by acids, alkalis, and other corrosive inorganic solutions up to 160°F. Material is light in weight and unbreakable.



Non-corrodible dipping basket

**Description:** Dipping basket fabricated from Agilene (polyethylene) is shown in illustration. This particular unit is of 3/8" polyethylene plate. It is 20" long, 12" wide, and 14" deep. Movable bail handle is made of unplasticized polyvinyl chloride.

(Dipping basket is product of American Agile Corp., Dept. CP, P. O. Box 168, Bedford, Ohio . . . check CP 8422, pgs. 2 & 3.)

## Protects and beautifies masonry surfaces

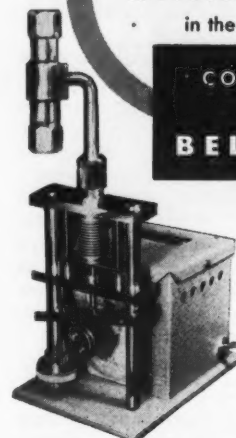
Coating based on Pliolite S-5, a synthetic rubber resin, is said to protect interior and exterior masonry surfaces, as well as asbestos cement shingles and siding. Product provides resistance against alkaline reaction from chemicals present in concrete and masonry. It is also an effective moisture barrier that prevents cracking and flaking. Six basic colors are available.

(Hysol masonry paint is product of Houghton Laboratories, Inc., Dept. CP, Olean, N. Y. . . or for more information check CP 8423 on handy form, pages 2 and 3.)

## HOW Contamination Is Prevented

in the

## CORSON-CERVENY MICRO- BELLOWS PUMP



All parts of the Corson-Cerveny Micro-Bellows Pump in contact with the liquid being pumped are made of stainless steel and machined so that they fit together without packing, gasket material or any pipe compounds. The use of accurately machined cone-to-taper fittings makes this feature possible.

For full information about construction, capacity, performance, write for copy of Pump Booklet.

For this reason, the pump will not contaminate material that it is handling, and is adaptable for many specialized laboratory uses.

## RESEARCH APPLIANCE COMPANY

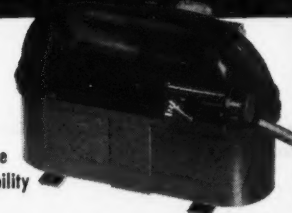
Box 463, West View Road, Pittsburgh 9, Pa.

When inquiring check CP 8424 on handy form, pgs. 2-3

## A REAGENT FEEDER THAT DEFIES CORROSION

## ★ THE NEW CLARKSON MODEL E IN RIGID PVC

- ★ Accurate
- ★ Economical
- ★ Corrosion-Proof
- ★ Wide Feeding Range
- ★ Complete Dependability



## PROVED PERFORMANCE PLUS PVC

The Clarkson Model E reagent feeder, with practically all of the mining industry market, has a long standing record of proved performance. Now fabricated entirely from rigid polyvinyl chloride, the new Model E feeder combines remarkable corrosion resistance with performance tested design, high accuracy and low cost. For all chemical industry applications, the outstanding value in reagent feeders is the Clarkson Model E in pvc.

Write today for Bulletin 541—it tells the full story.

## THE CLARKSON COMPANY

544 MARKET STREET • SAN FRANCISCO 4, CALIF.

When inquiring check CP 8425 on handy form, pgs. 2-3

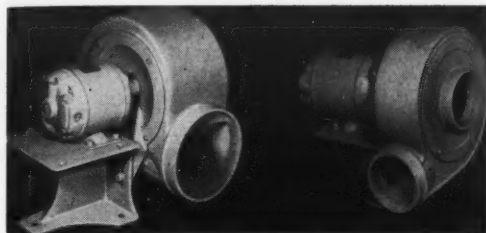
CHEMICAL PROCESSING

### Blowers and exhausters suited for use in moist, corrosive atmospheres . . .

large volume exhaust unit handles volumes to 2124 cfm at pressures to  $1\frac{1}{2}$ " static

**Uses:** Fans, with cast iron mounting and base, are furnished in two models for different applications. Model LV (large volume) is suited for laboratory hood exhaust or similar applications where moisture or corrosive gas is present.

Model PB (pressure blower) is primarily for use in industrial process work to supply or exhaust air. It, too, is coated or constructed of special materials to withstand corrosive or explosive atmospheres.



Large volume exhauster (left) and pressure blower

**Features:** Volumes up to 2124 cfm and pressures to  $1\frac{1}{2}$ " static are handled by Model LV. Volumes to 335 cfm and pressures to 4" static are handled by Model PB. Both units are furnished for 90° adjustment only as to position of discharge.

**Description:** Large volume model is available in four sizes with a forward curved wheel of all welded construction which is balanced both statically and dynamically. Pressure blower model utilizes a radial bladed wheel of aluminum alloy.

Self-aligning, grease-lubricated ball bearing pillow blocks are furnished as standard for quiet longevity and minimum maintenance. Bronze sleeve bearings, impregnated with graphite and having a large wool-packed oil reservoir, can be furnished if required.

All single-phase fractional size motors are resilient-mounted. Integral polyphase motors are rigid ball bearing models.

(Blowers and exhausters are products of Chicago Blower Corp., Dept. CP, 9867 Pacific Ave., Franklin Park, Illinois . . . or for more information check CP 8426 on handy form, pages 2 and 3.)

### Literature on polyethylene valves for corrosive fluids

Polyethylene valves offered for flow control of corrosive fluids are described in one-page bulletin. Diagrams, illustrations, and specification for 1 and 2" valves are given.

Bul on polyethylene valves is issued by Vanton Pump & Equipment Corp., Dept. CP, Empire State Bldg., New York 1, N. Y. When inquiring specify CP 8427, pages 2 and 3.



...and see for yourself  
how economical they are

The only way you can be sure that a corrosion-resistant material will work in your plant is to test it under actual operating conditions. Laboratory tests will give you some idea of what to expect, but they don't show the effects of the variables involved in production operations. That is why we have prepared standard test specimens of HASTELLOY nickel-base alloys . . . and they are available to you without cost.

Test these alloys yourself against the materials you are now using, or against others that you are considering using. Prove to yourself that they have exceptional corrosion resistance . . . high mechanical strength, even at elevated temperatures . . . and that they are economical to use. We can support these claims with records of laboratory tests and with case histories of actual installations in chemical, petroleum, textile, and metalworking plants over the past 20 years. But don't take our word for it—see for yourself.

Use the handy coupon below to order your samples of HASTELLOY alloys. Alloys B, C, and F are available in either cast or wrought forms, while alloy D is supplied as castings only. If the equipment you have in mind is to contain welded joints, be sure to advise us, so that we may furnish you with welded samples.

"Haynes" and "Hastelloy" are registered trade-marks of Union Carbide and Carbon Corporation.

These standard spool-type test specimens of HASTELLOY alloys are available on request.

<b>HAYNES</b> Trade-Mark		<i>Alloys</i>	
<b>Haynes Stellite Company</b> A Division of Union Carbide and Carbon Corporation UCC			
<b>USE THIS HANDY COUPON</b>		Haynes Stellite Company, UCC, Park & Lindsay St., Kokomo, Ind. Please send me, without obligation, the following samples of HASTELLOY alloys: (Please Check)	
<b>CAST</b>		<b>WROUGHT</b>	
<input type="checkbox"/> B	<input type="checkbox"/> C	<input type="checkbox"/> D	<input type="checkbox"/> F
<input type="checkbox"/> B		<input type="checkbox"/> C	
<input type="checkbox"/> Above samples should have welded joints.			
NAME _____			
COMPANY _____			
ADDRESS _____			

When inquiring check CP 8428 on handy form, pgs. 2-3





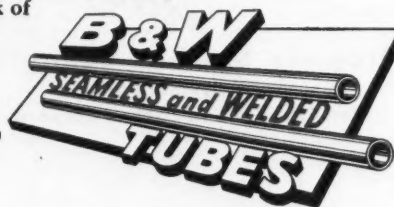
## What Mr. Tubes Can Do For You —about stainless steel tubing

Plenty! Corrosion and oxidation resistance, structural strength and appearance are only a few of the elements you want to consider in determining when and where to use stainless. Mr. Tubes can offer dependable help in obtaining the *best* grade and size to match the metal to your facilities and the end use you have in mind.

Mr. Tubes symbolizes the complete technical service enjoyed by users of B&W tubular products—available to you through B&W's headquarters technical staff, helpful regional representatives, and B&W's nationwide network of friendly, efficient tubing distributors.

### THE BABCOCK & WILCOX COMPANY TUBULAR PRODUCTS DIVISION

Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing  
Alliance, Ohio—Welded Carbon Steel Tubing



When inquiring check CP 8429 on handy form, pgs. 2-3

TA-1803(SWP)

## CORROSION

### Corrosive sea atmospheres withstood by heavy zinc coating . . .

also intended for immersion in sea water or fresh water

Sprayable and brushable heavy zinc coating protects steel against atmospheric exposures, including corrosive sea air. Material, known as Dimet-cote No. 3, is also intended for immersion in sea water and fresh water.

An exceptionally heavy material, coating weighs 29.6 lb per gal, of which 23 lb is metallic zinc. High solids content enables a one-coat application to provide a sufficient thickness to render long-time protection. Coating forms a hard, tightly adherent film which does not chalk or break down in sunlight and does not deteriorate with age.

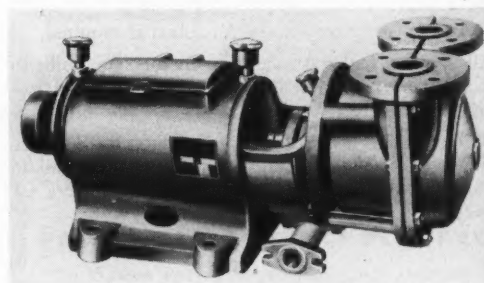
(Coating is product of Amercoat Corp., Dept. CP, 4809 Firestone Blvd., South Gate, Calif. . . . check CP 8430 on handy form, pages 2 and 3.)

### German chemical pumps are self-priming . . .

corrosion-resistant units are readily adaptable to portable use

**Uses:** For emptying vats, tank cars, acid containers, and deep subterranean tanks.

**Features:** Pump is self-priming, using the acid to be delivered. Manual priming is required only at the time of initial installation. No priming of the suction line is required, nor is it necessary to utilize a suction strainer or foot valve. Unit is highly corrosion-resistant and can easily be made portable for use at various installations throughout the plant.



Pump is free of excessive vibration

**Description:** Rheinhuette RE Sa Chemical Pump is manufactured in West Germany. Parts which come in contact with acid are made of corrosion-resistant materials, varying according to application. These include special gray cast iron (Perlite), silicon iron, chrome, hard lead, bronze, and rubber for linings.

Unit is free of excessive vibration. Maximum suction head is about 23' when delivering water

CHEMICAL PROCESSING

at 70°F.  
Hose conn  
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Dept. CP,  
or for more  
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Capacities  
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## CORROSION

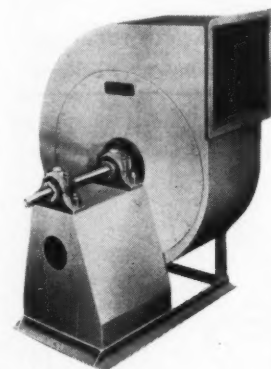
at 70°F. Pump comes equipped with flanges. Hose connectors for 1¼, 1½, and 2" sizes are furnished on request.

(Pump distributed by Neumann & Welchman, Dept. CP, 37 Wall St., New York 5, N. Y. . . . or for more information check CP 8431 on handy form, pages 2 and 3.)

### Capacities from 750 to 54,000 cfm furnished by rubber-covered exhaust blowers . . .

fan sets also available for corrosive service at capacities from 300 to 7000 cfm

Line of heavy duty rubber-covered exhaust blowers for corrosive or abrasive conditions in capacities from 750 to 54,000 cfm is announced. Units are protected against fumes of sulfuric, hydrofluoric, and other mineral acids by application of one of several kinds of rubber, depending on service requirements. Paddle fans are dynamically balanced for smooth operation. They maintain efficient suction at hoods despite varying static losses in overall system.



Rubber-covered exhaust blower for handling corrosives

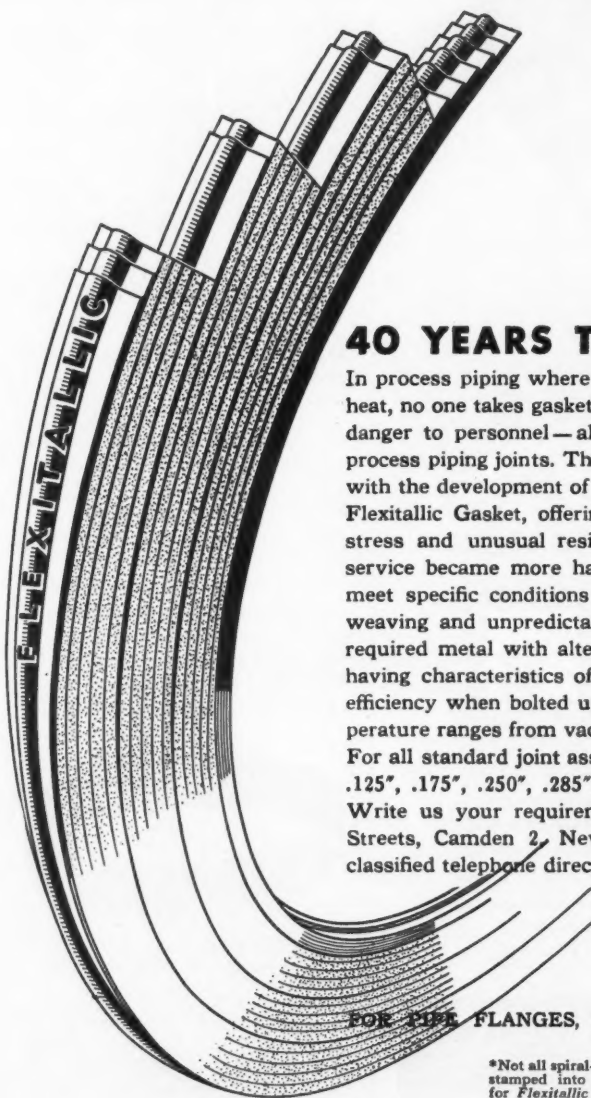
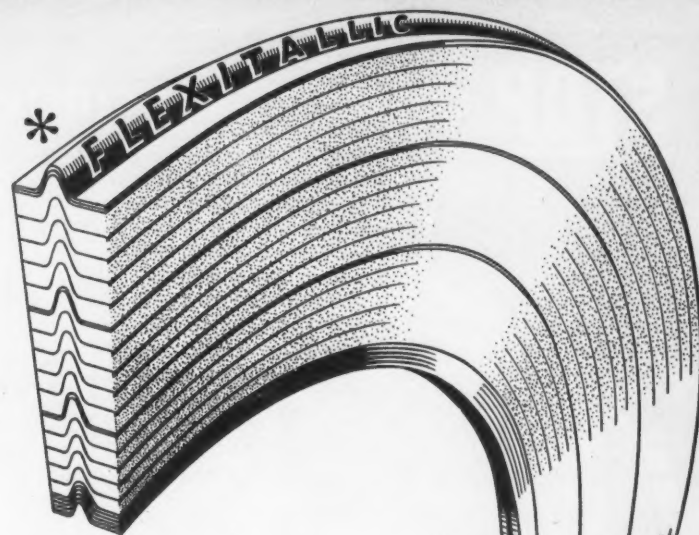
Also announced is a compact, self-contained exhaust fan set for moderately corrosive atmospheres in capacities from 300 to 7000 cfm. Units are supplied with either baked phenolic, vinyl, or latex coatings to resist a wide range of chemicals.

(Exhaust blowers are manufactured by Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland 11, Ohio . . . or for more information check CP 8432 on handy form located between pages 2 and 3.)

### Cathodic protection supplies listed in brochure

Exhaustive listing of cathodic protection equipment is contained in 36-page brochure. Schedule is broken down into 12 sections and contains information on rectifiers, anodes, wire and cables, insulating material, coatings, hole diggers, and instruments.

Schedule is available from Brance-Kracy Co., Inc., Dept. CP, 4411 Navigation, P.O. Box 1724, Houston, Texas . . . or check CP 8433 on handy form, pages 2 and 3.



### 40 YEARS TO MAKE THIS GASKET . . .

In process piping where fluids may be confined at 2500 lbs. and 1050° F. super-heat, no one takes gaskets for granted. Down-time . . . damage to equipment . . . danger to personnel — all these are factors demanding a safe, effective seal of process piping joints. The new era in safe sealing began more than 40 years ago with the development of the Flexitallic Spiral-Wound Gasket construction. The Flexitallic Gasket, offering the basic advantages of low seating stress, low bolt stress and unusual resiliency, has found increasing application each year as a service became more hazardous . . . Each Flexitallic Gasket is engineered to meet specific conditions of thermal and physical shock, corrosion, vibration, weaving and unpredictable joint stresses. Spirally wound V-crimped plies of required metal with alternating plies of proper filler results in a resilient gasket having characteristics of a calibrated spring. Flexitallic Gaskets are at highest efficiency when bolted up cold at a predetermined load. For all pressure/temperature ranges from vacuum to 10,000 lbs., from extreme sub-zero to 2000° F. For all standard joint assemblies. In four thicknesses for special requirements: .125", .175", .250", .285". With Teflon filler for corrosive chemical conditions. Write us your requirements . . . Flexitallic Gasket Company, 8th & Bailey Streets, Camden 2, New Jersey. Representatives in principal cities. Consult classified telephone directory.

**Flexitallic**  
SPIRAL-WOUND GASKETS

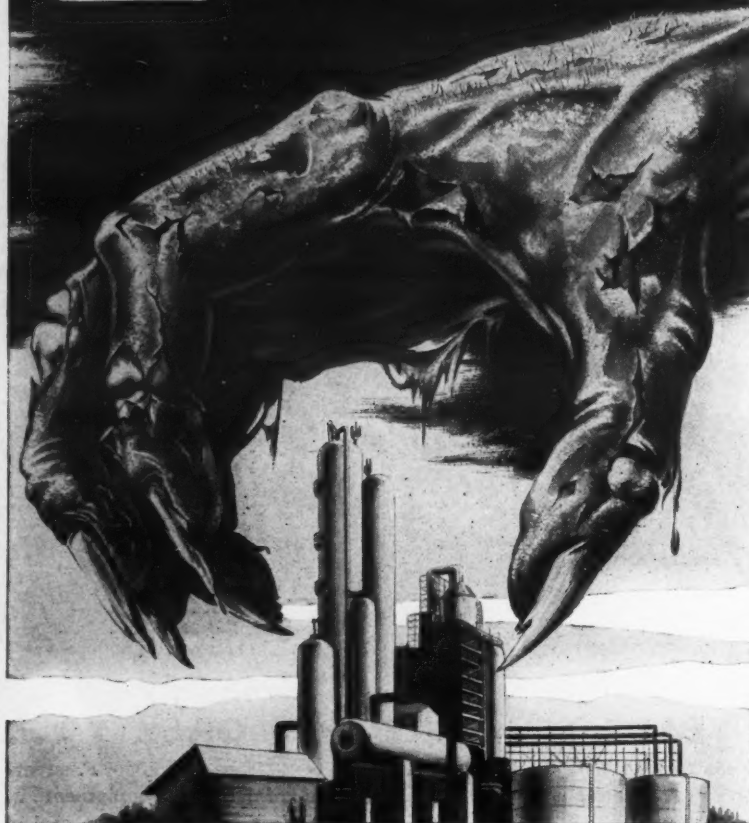
FOR PIPE FLANGES, PRESSURE VESSELS AND PROCESS EQUIPMENT

\*Not all spiral-wound gaskets are Flexitallic. Look for the name FLEXITALLIC stamped into the metal spiral of every genuine Flexitallic Gasket. Look for Flexitallic Blue — it's our exclusive blue-dyed Canadian asbestos filler.

When inquiring check CP 8434 on handy form, pgs. 2-3



# STOP COSTLY CORROSION!



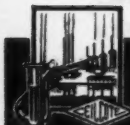
1907-CC

## ... WITH THE CEILCOTE COATING BEST SUITED TO YOUR PLANT CONDITIONS

CEILCOTE experience takes the "mystery" out of selecting the proper protective coating. Because no single coating will meet all corrosive conditions, CEILCOTE offers eight different types of organic coatings including phenolics . . . asphaltums . . . gilsonites . . . coal tar . . . epoxys . . . polyesters . . . vinyls and furfuryls.

Because CEILCOTE provides a complete range of laboratory tested and field proven protective coatings, there is no need to compromise . . . there is one particular coating best suited to meet your conditions. Send us the details and our staff of chemical engineers will evaluate and recommend a solution to your industrial coating problem.

Write today for new 8 page brochure (No. 150) giving complete information on base formulation . . . adhesion . . . abrasion resistance . . . chemical characteristics . . . film thickness and cost.



**THE CEILCOTE COMPANY**  
CORROSION-PROOF MATERIAL AND CONSTRUCTION

4834 RIDGE ROAD

CLEVELAND, OHIO

When inquiring check CP 8435 on handy form, pgs. 2-3

## CORROSION

### Polyvinyl chloride plates can be fabricated by hot gas welding

In addition to all standard methods of fabrication for thermoplastic materials, Vyflex rigid polyvinyl chloride can be fabricated by hot-gas welding. This makes possible the construction of complex units and structures such as fume exhaust hoods, acid tanks, and other equipment exposed to severe corrosive conditions.

Rigid polyvinyl chloride plates (1/16 to 1" thick), sheeting (.012 to .025" thick), and other special forms are available. Material is unplasticized and unmodified polyvinyl chloride, assuring outstanding corrosion resistance and high strength.

(Vyflex rigid polyvinyl chloride is product of Kaykor Industries, Inc., Div. of Kaye-Tex Mfg. Corp., Dept. CP, Yardville, N. J. . . . or for more information check CP 8436 on handy form, pages 2 and 3.)

### Plastic coating process provides protection from corrosion . . .

material does not reduce flexibility of casing

**Uses:** For coating flexible steel tubing, metal and paper-jacketed tubing, and other hard-to-coat materials.

**Features:** Method produces a smooth corrosion-resistant covering which does not reduce the flexibility of tubing itself. Procedure does not allow the coating



Coating process applies smooth, corrosion-resistant finish to tubing

to penetrate small openings in the item to be covered. Coating is also a means of retaining lubricants within the casing.

**Description:** Procedure for



## FIRST high temperature hose assembly using TEFLON\*

. . . handles even the most corrosive fluids to +450° F!

Fluoroflex-T hose assemblies mark a tremendous advance in flexible line serviceability. Look at these features:

- Fluoroflex-T (Teflon compound) tube . . . chemical-proof, non-swelling . . . absorbs vibration
- Flexibility that doesn't change from -100° to +450°
- Stainless steel braid—for 1000 psi working pressures and for high external corrosion resistance
- Compact fittings swaged to armor and tube—won't blow off
- Light weight! Space saving! Non aging!

Write for Bulletin FH-1.

\*DuPont trademark for its tetrafluoroethylene resin.

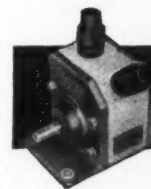
†Resistoflex trademark for products from fluorocarbon resins.

**RESISTOFLEX corporation**

Belleville 9, New Jersey

When inquiring check CP 8437 on handy form, pgs. 2-3

## VANTON PUMP TAMES CORROSIVE CHEMICALS



rigid-unplasticized PVC  
flex-i-liner PUMPS

are designed to handle the toughest corrosive chemicals and abrasive slurries.

The durable precision molded flexible liner and the pump body block are the only parts contacting the fluid.

- No stuffing boxes, shaft seals, check valves, glands or gaskets to worry about.

Body blocks in: Polyethylene, Bakelite, Buna N Hard Rubber, unplasticized PVC, Stainless Steel. Flexible liners in: Natural and pure gum rubber, Neoprene, Hycar, Buna N, Vinyl, Compac and Silicone. The wise choice of materials means trouble free, corrosion free service.

Pump capacities from fractional to 20 gpm. Illustrated booklet on request, as well as descriptive literature on complete line of corrosion resistant centrifugal pumps, valves, pipe and fittings.



**VANTON**  
PUMP & EQUIPMENT CORP.  
EMPIRE STATE BLDG. NEW YORK 1, N. Y.

When inquiring check CP 8438 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## CORROSION

applying plastic coatings is essentially similar to wire coating. Process is applied to customer requirements. Various types of thermoplastic materials are used, such as polyvinyl chloride, polyvinyl chloride acetate, polyethylene, and Saran.

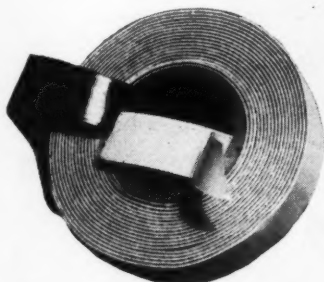
(Plastic coating process is a development of Pyramid Plastics, Inc., Dept. CP, 554 W. Polk St., Chicago 7, Ill. . . . check CP 8439, pages 2 and 3.)

### **Resistance to acid is furnished by rubber tape . . .**

can be applied lengthwise  
by pinching

**Uses:** For electrical and general purpose use.

**Features:** Waterproof tape is resistant to acid as well as to general corrosion. Its cohesiveness makes it possible to apply tape lengthwise by pinching.



Two-ply tape showing black cured and light uncured sides with Holland cloth separator

**Description:** Two-ply rubber tape is black on cured side and light on uncured side, with Holland cloth separator. Tape is impervious to copper and has a 19,000 v dielectric strength. Elongation factor is 600% and tensile strength 19 lb per inch of width.

(CSI Cable Splice Rubber Tape is product of CSI Sales Co., Dept. CP, Solon Center Bldg., Solon, Ohio . . . check CP 8440, pgs. two and three.)

For more information on product at right, specify CP 8441 . . . see information request blank between pages 2 - 3.



DON'T TAKE OFFICE WORRIES HOME

# Relax!

Slip on your robe, cuddle up with a good book and forget about the plant. You've done your best today, and you need relaxation to keep on doing your best.

If you've specified Cooper Alloy stainless steel castings, valves or fittings for those corrosive operations, you've put your problem in hands you can trust. Our thirty years of experience is your guarantee of quality products—use them with confidence and relax!



propeller



fitting



valve



Quikupl



mixer



## COOPER ALLOY

THE COOPER ALLOY FOUNDRY CO. • HILLSIDE, N. J.  
Los Angeles San Francisco Oakland Houston Chicago Detroit Philadelphia Hartford  
Leading producers of STAINLESS STEEL valves, fittings and castings





BLACK DIAMOND  
VALVE BAG

# packer & settler

FOR A **BETTER** PACKAGE...

investigate this new, sensational combination of automatic controlled weight valve bag packer and settler.

**EASIER HANDLING  
& PALLETIZING  
CLEAN—NO DRIBBLE  
ACCURATE  
ECONOMICAL  
PERFORMANCE  
GUARANTEED**

For further information, write

**BLACK PRODUCTS COMPANY**

13513 Calumet Ave., Chicago 27, Illinois • Dept. P33  
MANUFACTURERS SINCE 1912

Packer and  
Settler may be  
purchased as  
separate units

When inquiring check CP 8442 on handy form, pgs. 2-3

## KEEP IT MOVING!

Granular  
or wet materials  
noiselessly

Whatever your particular problem may be—if you want to move materials by effective vibration, there is a Peterson Vibrolator to fit your needs perfectly. Spark-proof, all-directional vibration for bins, chutes, or hoppers. Require no maintenance or lubrication. Guaranteed instant self-starting every time. A variety of sizes and models including one which operates at ambient temperatures up to 1000°. Write for literature and complete specifications.

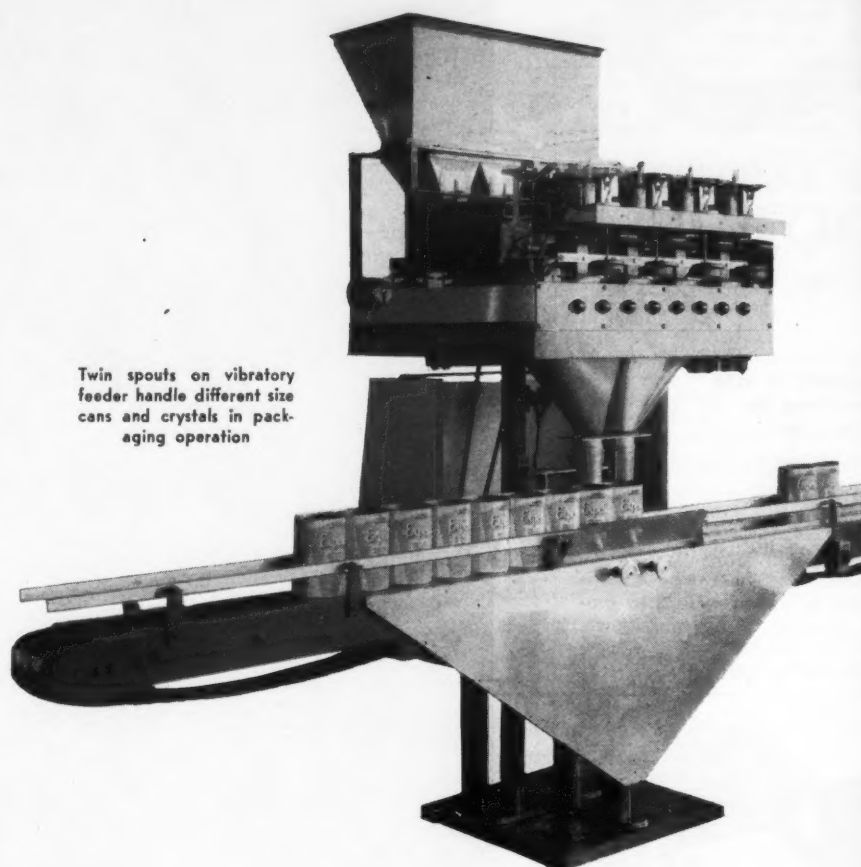
**MARTIN**

**ENGINEERING COMPANY**

KEWANEE 1, ILLINOIS

When inquiring check CP 8443 on handy form, pgs. 2-3

## packaging



Twin spouts on vibratory feeder handle different size cans and crystals in packaging operation

## two different particle sizes filled by one machine

**Bulk and dribble flow, side by side,  
pack containers of varying capacities  
at Judson Dunaway Corporation**

**Problem:** At the Judson Dunaway Corp. of Dover, N.H., there was a definite need to find one filling machine, fully automatic, which would fill various size cans. In this case the range was from 12 oz to 10 lb, with sizes actually 12 oz, 1, 2½, 5, and 10 lb. In addition to this, there was the difficult problem of packing two different sizes of Expello (paradichlorobenzene crystals) in each of these cans. The small crystal is similar to rice,

while the large crystal is similar in size to "an old-fashioned Canadian peppermint." Speed of production and accuracy in weight are essential to this operation.

Production manager of Judson Dunaway attended the National Packaging Show in Chicago in April, 1953 in search of such a machine. Assuming there was no standard make, he contacted many packaging people who expressed a doubt that any one machine would do all the jobs required.

**Solution:** A quotation was finally obtained on a machine, and in approximately three months it was made and installed in the factory on the Expello line.

The unit, now in operation, is called the Twinflow. It is a vibratory feeder which

combines  
deck on

Narrowing  
from hop  
however,  
alongside

Vibration  
trip lever  
output r  
actuate f  
dribble  
narrow v

A special  
to five p  
limit swi  
discharge  
supply c  
special li

**Results:**  
Judson I  
in opera  
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oz cans,  
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Closeu

combines a narrow dribble deck with a wide bulk deck on a single base.

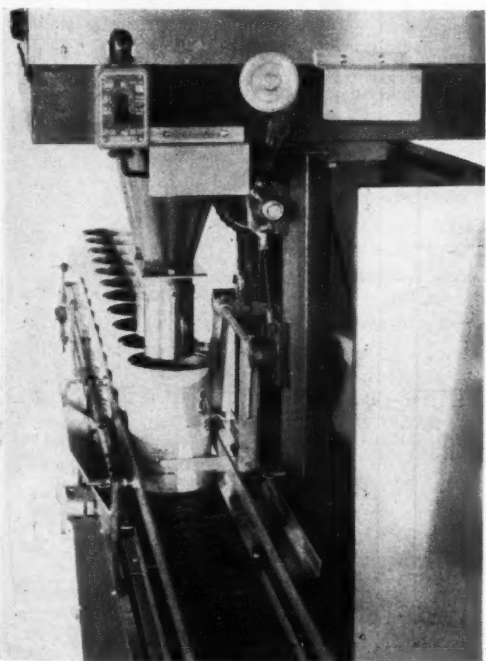
Narrowing a dribble deck can cause bridging from hopper. With this unit bridging is minimized, however, and single file dribble feed is possible alongside of bulk flow.

Vibration transfer of unit is eliminated by solenoid trip lever permitting individual operation at different output rheostat-controlled speeds. Beam limit switches actuate feeder for dash pot dampened fast bulk and dribble weight pickup. Finish fill dribbles from narrow vibrator deck section.

A specially adapted PMV-4 net weigher fills 12 oz to five pound cans, complete with automatic, no-can limit switch and guaranteed fill. Weigher will not discharge until up to weight. A battery of presses supply crystals of Expello and can equipment makes special lift lids.

**Results:** According to production manager, Judson Dunaway has found this feeder satisfactory in operation. It has solved the problem of filling containers of varying capacities with two different product sizes. Accuracy is insured, and speed of production ranges from 35 units per min for 12 oz cans, to 10 units per min for 10 lb containers. In addition, comparative economies were realized in obtaining the machine and placing it in operation.

(Twinslow vibratory feeder is a product of Weigh Right Automatic Scale Co., Dept. CP, East Mills Rd., Joliet, Ill. . . . or for more information check CP 8444 on handy form, pages 2 and 3.)



Closeup of Expello filling line served by bulk and dribble unit

# all's well that ends well!

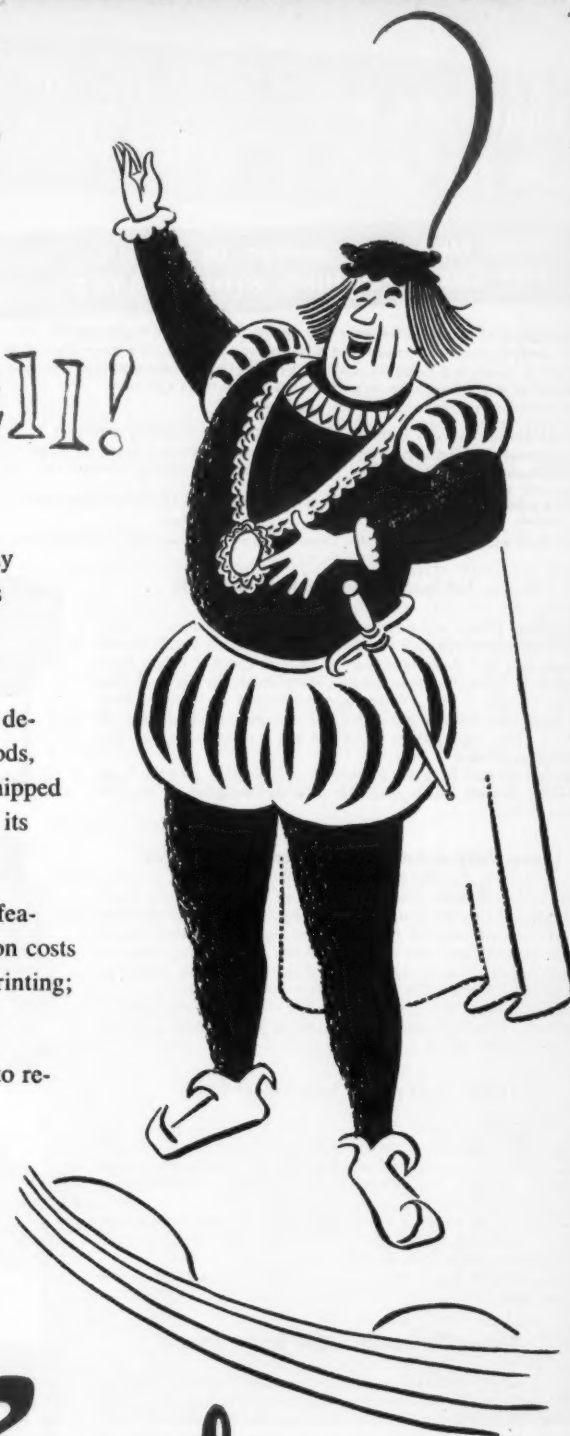
THIS TITLE of a Shakespearean comedy may well apply to the shipment of commodities in Multiwalls which prevent the tragedy of waste in transit.

In designing Raymond Multiwalls we first determine, through sound engineering methods, all stresses caused by the product to be shipped and then produce the sack that will assure its safe delivery by any type of carrier.

Safe construction (with special protective features when required); savings in production costs wherever practical; clean, sharp, legible printing; and deliveries *when promised*.

Call in a Raymond man. Maybe it's time to review *your* package needs.

THE RAYMOND BAG COMPANY,  
Middletown, Ohio. Phone 2-5461.



**Raymond**  
**MULTIWALL PAPER**  
**SHIPPING SACKS**

When inquiring check CP 8445 on handy form, pgs. 2-3



## Theorizing about weighing problems when you should be THAYER-IZING them?

### SAVE TIME AND MONEY IN BAGGING, BATCHING AND CHECKWEIGHING WITH THAYER SCALES.

Why guess or gamble with improper scales. Use Thayer scales and enjoy outstanding accuracy, speed and convenience which assure quantity and quality control. Whether yours is a bagging, batching or checkweighing problem involving powder, pellets or dry mixes these important Thayer features can save you man-hours and increase your production:

- Shockproof leverage system — no wear-vulnerable knife-edge pivots.
- Automatic control and operation — you minimize "human factor" in weight determinations.
- Optional design features — capacities, controls, feeding systems, etc., easily designed to suit your needs.
- Precision construction — expert construction to proven design assures accuracy over long periods.

For more complete details on the Thayer Scale suited to your job, write outlining your problem.

#### Thayer Automatic Filling Scale Model 600G

For holding, filling and checkweighing bags of powdered materials to tolerances within 2 oz. Feeder handles both highly flooding materials and those which flood only at times. Utilizes both gravity flow (plus compressed air or vibration when needed) and positive "dribble" feed. When proper weight is reached, feed gates close and checkweight lights indicate end of filling cycle. If weight is O.K., light flashes and filled bag is dropped or held for push button release.

Handles up to 6 bags per minute of unit weights ranging from 25 to 200 pounds. Also available as a net-weigher. Write for Bulletin 600G.

#### Thayer Fully-Automatic Filling Scale Model 400N

New fully-automatic scale for weighing and discharging loads for bagging or batchweighing. Dry materials in granular or pellet form are readily handled by unique feeding system that closely controls amount and rate of feed of any free-flowing material without pre-aerating or separating. Once speed and weighing controls are set, operation is completely automatic.

Handles weight units from 25 to 200 pounds at speeds up to 10 units per minute. Stainless steel feeding system. Also available as gross-weigher. Write for Bulletin 400N.

#### Thayer Checkweight Scale Model 200R

Automatically indicates weight of filled bags, drums and cartons. Offweight packages are separated from those properly filled by having the motor-driven, two-way conveyor deposit them at opposite ends of scale. Over- and under-weight tolerances are independently adjustable over a wide range.

Dial shows how much each package is offweight and horn sounds as each improperly filled package is discharged. Optional signal lights, remote dials, etc. available.

Model 200R handles up to 20 packages a minute with unit weights from 20 to 200 pounds. Write for Bulletin 200R.

#### Thayer Checkweight Scale Model 200S

This Thayer scale has same performance specifications as Model 200R but has the conveyor platform belt only 10" above the floor. With the conveyor located beneath the scale, the spillage from broken bags will fall to the floor and not affect the weight of the bags which follow.

Like the Model 200R, this scale may be equipped with additional dial indicators for installation at remote control stations, colored lights which show whether the package on the conveyor is over- or under-weight, or a printing recorder which records the exact weight of each package. Write for Bulletin 200S.



**THAYER SCALE AND ENGINEERING CORPORATION**

492 EAST WATER STREET, ROCKLAND, MASS.

Where weight is worth money . . . it pays to be sure!

When inquiring check CP 8446 on handy form, pgs. 2-3

## PACKAGING

**Properly clinched cartons assured by check of five simple rules . . .**

save costs, contributes to smooth production

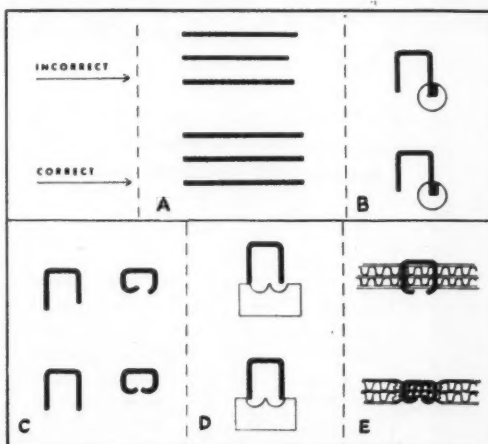
A good stitching machine operator should be able to tell a good stitch when he sees one. Viewed from the crown side, a stitch may appear to be correct but this is no assurance that it is properly clinched. For this reason, the efficient operator inspects stitches periodically by turning the carton over and glancing at the clinched portion of the stitch legs to determine whether all stitches are satisfactory. In general, a good stitch is one which has its crown flush with the surface of the material being stitched and the legs clinched tight enough to partially bury the ends.

Observation of five simple principles saves time, costs, and contributes to smooth production. They are:

A) Wire Draw. The amount of wire drawn must be in accordance with the work thickness of each job — or about 3/16 to 5/16" longer than the thickness of the compressed material. In addition, the wire draw must be continually uniform for any one job. Check the length of the piece of wire after it is cut and just prior to its being formed into a stitch to make certain all pieces are of equal length.

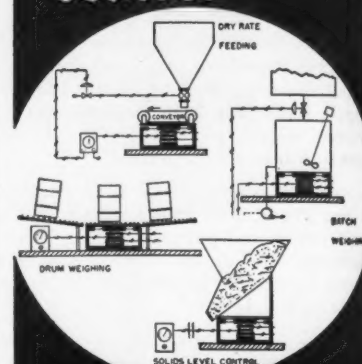
B) Proper Wire Cut-off. The ends of each wire length must be free from burrs. When a sharp cut-off is not effected, the stitch legs will not penetrate straight through the material being stitched, and the stitch legs will not be clinched properly. If several stitches are cut off and formed by turning the flywheel by hand, and then removed before clinching, any burrs existing can be easily detected by rubbing the fingers over the ends of each wire length.

C) Stitch Legs of Equal Length (plus or minus 1/16"). Hand-turn the flywheel, slowly forming and clinching sufficiently to determine the equality of stitch-leg length. As stitch legs start to project from the formers, leg length can be determined by



Check these signs of stitcher accuracy frequently:  
A — uniformity of wire draw; B — sharp cut-off;  
C — equal leg length; D — alignment of clincher block; E — proper compression of material

## a NEW tool for process control



### W/C Weighing Scale PNEUMATIC-PLATFORM TYPE

- For batch or continuous weighing of solids or liquids
- For remote indication or continuous flow control
- With accuracy above 0.25% of range
- Highly sensitive, extremely rugged
- No springs, knife edges, or levers
- Unaffected by off-center loading on platform
- Unaffected by vibration

Here's the latest step toward continuous process control of your plant — especially in explosive or dusty atmospheres. It's the new W/C Weighing Scale — fully tested, proved, and guaranteed to cut processing time or improve your yield. Based on the same balance principle, the W/C Weighing Scale translates weight into a pneumatic output signal. It is furnished complete with a remote panel containing a weight indicating scale 45 inches long.

Available in ranges up to 5000 pounds, it is the first device that reliably uses weight as a criterion of measurement to meet the demands of modern process control.

WRITE FOR Catalog which gives complete details, engineering drawings, and calibration curves.

**WEIGHING COMPONENTS, INC.**  
64 Fulmor Ave. • Hattisburg, Pa.

When inquiring check CP 8447 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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brushing fingers over bottom of the former.

D) Proper Alignment of Clincher Block. The clincher block must be aligned so that each stitch-leg will contact the clincher block grooves in the same relative position. By hand-turning the flywheel, alignment of legs with the clincher block groove may be observed, and if necessary, corrected.

E) Sufficient Compression of Material. Material is compressed between formers and clinchers to get a satisfactory stitch. To secure proper compression, clincher block should be raised or lowered as required by adjusting necessary parts until formers mark the material slightly. Excessive compression will crush or damage material. Insufficient compression will result in an improperly clinched stitch. In making compression adjustments, lower the clincher to its lowest position. Then raise gradually until a good stitch is obtained, indicating proper compression.

Shipping and packaging departments should become familiar with basic carton-closing requirements which cover placement of stitches formed from various types of wire. In most cases, regulations will be met if stitches are not placed more than 2 1/2" apart along outer seams.

(Summarized from data furnished by Acme Steel Co., Dept. CP, 2840 Archer Ave., Chicago 8, Ill. . . . or for more information reader may simply check CP 8448 on handy form which is located between pages 2 and 3.)

#### **Closes center-slotted carton top, bottom simultaneously**

Large, semi-automatic staplers illustrated and described in 8-page brochure close center-slotted cartons top and bottom simultaneously, or will close tops only or bottoms only, as needed.

Company has listed specifications on carton size capacity, available adjustments, number of closures per hour, and safety devices. A page is devoted to Retractable Anvil staplers and their operation.

Other points discussed in booklet include floor space requirements, loading, carton re-use, operation of machines and their conveyor units. Sizes of cartons the models will handle, plus carton specifications, facts about wiring, air pressure, and consumption are detailed.

Bul Q-501 is issued by International Staple & Machine Co., Dept. CP, 801 Herrin St., Herrin, Ill. When inquiring specify CP 8449 on handy form, pages 2 and 3.

#### **For a guide to packaging ideas . . .**

You'll find what you need in the handy Product Directory on pages 213 to 216. All products and processes are listed there.

# Continental's formula for drumming up business: **SERVICE**



A great new fibre drum plant in Pittsburg, California gives Continental a cross-country coverage unmatched by any other supplier.

Continental's other plants are at:

Tonawanda, New York  
Reading, Pennsylvania  
Van Wert, Ohio  
St. Louis, Missouri

From the wide variety of Continental fibre drums, you choose the size and style Tailor-Made for your product. Three bump-resistant, sure-locking, easy-opening styles: Leverpak, Stapak, Fiberpak. Your choice of many sizes, 17 different colors, 14 different inks. Special protective linings available for all of them.

You get more than lightweight, sturdy packaging when you buy Continental fibre drums. You get the *service* of Continental's nation-wide fibre drum division.

That means you have at your command Continental's experienced packaging engineers in twelve cities scattered all over the country. You have the use of Continental's research facilities. We will help you to test your packaging methods, to improve your old system or to establish a new and better system. We will help you to crack tough packaging "nuts". And don't forget Continental's quick deliveries to any point in the United States from our five fibre drum plants.

Call on Continental for packaging advice and efficient service!



## CONTINENTAL © CAN COMPANY

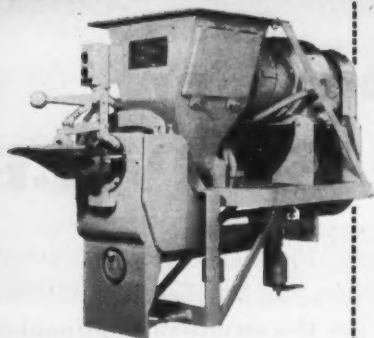
FIBRE DRUM DIVISION • VAN WERT, OHIO

**TAILOR-MADE  
PACKAGE SERVICE**

NEW YORK • PHILADELPHIA • PITTSBURGH, PA. • TONAWANDA • CLEVELAND • CHICAGO  
ATLANTA • ST. LOUIS • SAN FRANCISCO • LOS ANGELES • EAU CLAIRE • PITTSBURGH, CALIF.

When inquiring check CP 8450 on handy form, pgs. 2-3





*It's New!!*

## Econo-SPEED

bag packer  
designed and made by



- Fills valve or open-mouth bags and drums.
- Handles granulated or powdered materials.
- Delivers 1 cubic foot in 5 to 10 seconds depending on material.
- Low first cost . . . Low operating costs.
- No extras to buy — just plug it in!

Send for our catalog sheets —  
They give complete specifications and  
construction details.

When wanted, bag rest attaches  
easily to scale beam plate.



Scale beam is set by operator at  
front. Accurate weight—within  
1% depending on material.



Filling screw is tapered to elimi-  
nate jamming—assures continu-  
ous flow.



Fastens directly to hopper, area  
beneath is clear and easy to clean.

\*Stoker Packers have been performance-  
proven in commercial operations by  
many of the largest users of packaging  
equipment in the world . . . Names on  
request.

**H. L. STOKER CO.**

111 SO. COLLEGE AVENUE, CLAREMONT, CALIFORNIA

When inquiring check CP 8451 on handy form, pgs. 2-3

# for Pumping SULPHUR

Request  
BULLETIN  
V-837

FIG. 19.478

**This TABER centrifugal, Vertical Pump**  
was designed to handle molten sulphur.  
Note the massive construction. Support-  
ing the suspended pump from channel  
steel permits the use of an open shaft.  
This is especially desirable for molten  
sulphur.

Steam jacketed discharge pipe keeps  
molten materials from solidifying.

Pump operates efficiently at the rela-  
tively slow speed of 1750 r.p.m. (We  
consider 3600 r.p.m. prohibitive be-  
cause molten sulphur has no lubri-  
cating properties.)

Write us the Head, and gpm you wish  
to handle together with the depth of your  
sulphur pit, and we shall send further  
information, with BULLETIN V-837.

**TABER PUMP COMPANY**  
320 ELM STREET • BUFFALO 3, N. Y.

## TABER PUMPS

Est. 1859

When inquiring check CP 8452 on handy form, pgs. 2-3

## PACKAGING

**Five gallon cans filled  
with liquids at rate  
of 20/min . . .**

rotary unit is adjustable to nature of liquid  
being dispensed

**Uses:** For large quantity liquid filling of five  
gallon cans.

**Features:** Adjustable to nature of liquid being  
dispensed, machine is capable of filling as many  
as twenty cans/min at a continuous rate of speed.

**Description:** Being completely free of any in-  
tricate metering devices, rotary filler provides  
smooth, trouble-free operation. Only two men  
are required, one to feed empties onto filling sta-  
tions and one to remove and cap filled cans. No  
lifting is required. Conveyors are brought to  
unit so cans are fed to and from filling stations.

Rotary table on which there are ten filling stations  
is powered by a 1 1/3 hp, 110v, 60c motor. Each  
station is adjustable to five gal volume plus or  
minus one pint. Supply line from source of ma-  
terial enters from top. Liquid then flows to cylin-  
der located beneath revolving table and from  
there, by positive displacement, is delivered to  
cans. Manufacturer states that accuracy of each  
charge is within 1 cu in or .001155%.

No special set-up is required. Machine need only  
be placed in a level area of 50 sq ft. Lagging is  
not necessary, since machine has no inherent vibra-  
tions to give it a tendency to creep. An auto-  
matic cutoff will not allow filled containers to pass  
discharge point. All motion can be arrested by  
hand if operator is not near a switch.

(Rotary liquid filling machine is a product of  
Drum Equipment Corp., Dept. CP, 945 Lehigh  
Ave., Union, N. J. . . or for more information  
check CP 8453 on handy form, pages 2 and 3.)

**Prints small paper or fabric labels  
from rolls of blank material . . .**

unit will rewind, perforate, or cut off and  
stack printed stock

**Uses:** For producing complete small paper or  
cloth labels from rolls of blank material.

**Features:** Label stock is fed from roll, printed  
and rewound, perforated (ready for tearing) and  
rewound in a roll, or cut off and neatly stacked.

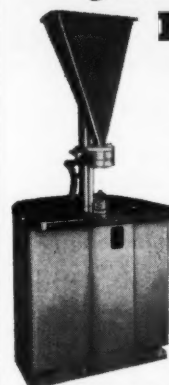
Unit may be equipped with a pre-determining  
automatic counter which stops machine after a  
preset number has been printed, or a five-wheel  
quick reset counter which indicates number of  
labels which have been printed.

**Description:** Model 126 printer comes in four  
types: 126A for single color imprints, maximum  
2 x 3"; 126B for single color imprints, maximum  
2 x 6"; 126C for two color imprints, maximum 2 x  
3"; and 126D for two color imprints, maximum  
2 x 3", or single color imprint, maximum 2 x 6".  
Automatic feed is up to 6 3/4" in length.



## VACUFLOW

*Dustless*  
**POWDER  
FILLING**



Vacuflow powder fill-  
ing equipment oper-  
ates on a principle of  
vacuum feeding, in-  
stead of pressure, to  
pack powder into a  
container.

Air is removed from  
the container to cre-  
ate a vacuum which  
draws a measured  
quantity of powder  
from the hopper.

There is no problem  
with dust control, since the unique Vacu-  
flow method simply does not involve air  
currents that cause dust.

Semi-automatic models are available  
for filling containers ranging from the  
tiny talcum box up to and including 100  
lb. paper bags and 200 lb. drums. Rotary  
models are available for automatic produc-  
tion of 5 lb. sizes or less at speeds of 45 to  
300 per minute.

Pneumatic is the one manufacturer in a  
position to furnish machines for making up  
complete production lines. Units are avail-  
able for air cleaning, powder and liquid  
filling, capping and labeling a wide range  
of bottles, cans or jars.

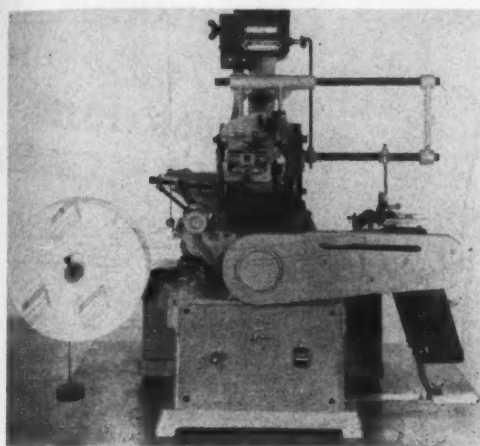
**PNEUMATIC SCALE CORP., LTD.**  
67 Newport Ave., Quincy 71, Mass.  
Also: New York; Chicago; San Francisco;  
Los Angeles; Seattle; Leeds, England

Canadian Division:  
Delamere & Williams Company, Ltd., Toronto



When inquiring check CP 8454  
on handy form, pgs. 2-3

CHEMICAL PROCESSING



Marker may be equipped with an automatic counter

Typeholding method is designed to facilitate quick changes of type. Specially designed type is available in individual characters and solid engraved blocks in many sizes and styles. Trademarks and special designs may be accurately duplicated.

Inks are formulated and manufactured to give high quality impressions on various fabrics and papers used for printing labels.

Machine is bench mounted, space consumed being 20 x 23", height 26".

(Marking Machine is a product of Markem Machine Co., Dept. CP, Keene, N. H. . . or for more information check CP 8455, pages 2 and 3.)

#### Strapping tapes, P-S and gummed, added to manufacturer's line

Company's strapping system has been expanded to include a complete line of strapping tapes, both pressure-sensitive and gummed, as well as dispensers for all applications. Tapes are filament-reinforced to provide high tensile strength. They supplement manufacturer's line of steel strapping.

(Strapping tape is a product of Brainard Steel Div., Sharon Steel Corp., Dept. CP, 1940 Larchmont Ave., N.E., Warren, Ohio . . . or for more information check CP 8456, pages 2 and 3.)

#### Closing of small paper bags detailed in four pages

Emphasizing importance of speed and economy in closing small paper bags, 4-page bulletin describes and illustrates equipment designed for these operations. Features of machine's sewing head and advantages of tape closure are detailed.

Bul 100 is available from Union Special Machine Co., Dept. CP, 400 N. Franklin St., Chicago 10, Ill. When inquiring specify CP 8457 on handy form, pages 2 and 3.

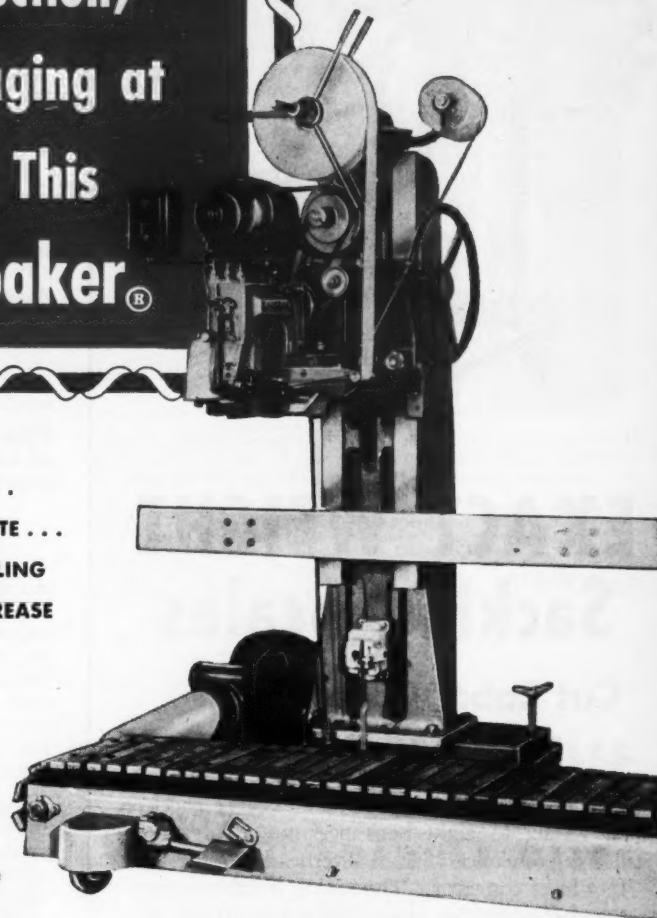
## Get Better Protection, Faster Packaging at Lower Cost With This Model ET Bagpaker®

**CLOSES OPEN-MOUTH, MULTIWALL  
PAPER BAGS SEMI-AUTOMATICALLY . . .  
TAPES AND SEWS 15 BAGS A MINUTE . . .  
TEAMS UP WITH YOUR EXISTING FILLING  
AND WEIGHING EQUIPMENT TO INCREASE  
PACKAGING EFFICIENCY**

You don't have to scrap your present equipment to get *stronger*, more *economical* bag closures with this Model ET Bagpaker. One man—receiving bags from your existing weighing and filling set-up—applies creped "kraft" sealing tape over the bag end...sews a reinforced "cushion stitch" through both tape and bag...and neatly trims tape...time 4 seconds or less. Dimensional drawings and detail information are available in Booklet ET-E-12. Write for your copy *today*. Bagpak Division, International Paper Company, 220 East 42nd St., New York 17, N. Y.



Model ET applies famous "Cushion-Stitch" over dry tape for sift-proof closure. Model E-1 applies "Cushion-Stitch" only, for use where sift-proofing is not essential.



#### Check These Model ET Bagpaker Advantages

- ★ 15 bags per minute with one operator when filled bags are continuously delivered to conveyor.
- ★ Quickly adjustable for bags of from 25 to 100 lb. capacity.
- ★ Completely portable. Mounted on casters, can be moved easily to various packaging stations.
- ★ Bag starts and stops sewing head when equipped with automatic sewing head control.
- ★ Hoepner No. 150 Heavy Duty sewing unit with automatic brake to prevent "coasting".

**International Paper** COMPANY  
BAGPAK DIVISION

BRANCH OFFICES: Atlanta • Baltimore • Boston • Springfield • Kansas • Boston  
Chicago • Cleveland • Denver • Detroit • Kansas City, Kansas • Los Angeles  
New Orleans • Philadelphia • Pittsburgh • St. Louis • San Francisco • St.  
CANADA: The Continental Paper Products, Ltd., Montreal, Ottawa, Toronto

When inquiring check CP 8458 on handy form, pgs. 2-3





Sales and  
Service from  
Coast to  
Coast

## EXACT WEIGHT Sacking Scales

Cut Labor Costs . . .

Eliminate Over-weights

One man can bag, weigh, and visibly check-weigh six to eight bags per minute of free-flowing chemicals from overhead hopper to foot-level conveyor. The saving in labor costs, together with the saving from elimination of over-weights, pays for the installation. Simple to operate, the EXACT WEIGHT Sacking Scale has only two controls. It takes just four easy motions to attach a bag, fill it, weigh it, and release to conveyor. Built for hard service, has agate bearings set in metal, alloy-steel pivots with hard chromed finish, and fittings of stainless steel and brass. Scale will handle multi-wall paper, paper-lined, cotton, or burlap bags. Available with automatic valves. Write today for full details!

**Exact Weight  
Scales**

Better quality control

Better cost control

THE EXACT WEIGHT SCALE COMPANY

905 W. Fifth Avenue, Columbus 8, Ohio  
2920 Bloor St. W., Toronto 18, Canada

When inquiring check CP 8459 on handy form, pgs. 2-3

## PACKAGING

### Label, trade mark design facilities offered by pail and drum maker

Modern facilities for lithographing customer's label and trade mark designs on steel shipping containers have been announced by container manufacturer.

Customer's present designs can be duplicated, or new designs can be developed. All sizes of pails and drums from one through eight gallons, open head and closed head, can be lithographed.

(Lithographing facilities and steel containers announced by Vulcan Steel Container Co., Dept. CP, PO Box 786, 3315 N. 35th Ave., Birmingham, Ala. . . or for more information check CP 8460 on handy form, pages 2 and 3.)

### Packs rubber O-rings individually in heat-sealed wrapping which meets Government specs . . .

system prevents loss due to excessive handling and protects against grease, moisture, corrosion

An automatic packaging machine has been developed to seal rubber O-rings in individually stamped envelopes to meet Government specifications. Enclosing each O-ring in its own heat-sealed wrapping, machine was perfected to save time and cost previously lost in hand sealing. O-rings can now be received already sealed and printed with part number, date of manufacture, and any other pertinent information desired.

Packaging method also prevents loss due to excessive handling and protects precision rubber rings from grease, moisture and corrosion. Waste is cut by making possible easy storage accessibility and accurate tally.

(Packaging machine is a development of Stillman Rubber Co., Dept. CP, 5811 Marilyn Ave., Culver City, California.)

### Packs free-flowing materials in 100 lb open-mouth bags at speeds to 20/min . . .

bagger works in conjunction with a conveyor and sewing head

**Uses:** For automatic weighing and filling of all types and sizes of open-mouth bags with free-flowing, non-bridging material.

**Features:** In plant installations, bagger is said to have packed 100 lb open-mouth multiwall bags at speeds of from 18 to 20/min.

**Description:** Inglett & Corley Bagger works in conjunction with a moving conveyor and sewing head. Weighing and filling cycle is completely automatic and begins when operator pushes starter button. This automatically delivers pre-weighed material through machine's bag chute in an endless



- A truly portable bag closer . . . weighs only 10½ pounds.
- Lowest priced bag closer on the market.
- Requires no installation . . . plug into any outlet.
- Handles textile and paper bags.

Thoroughly-proved by thousands of users all over the world to be practical and efficient under varying conditions for constant or occasional use in large or small plants.

Address inquiries to:

DAVE FISCHBEIN COMPANY, Industrial Sewing Machinery

Dept. 9B, 38 Glenwood Avenue, Minneapolis 3, Minnesota  
When inquiring check CP 8461 on handy form, pgs. 2-3



**MARMAN**  
Stainless Steel T-bolt Band Clamp

The new Marman-designed, "Infinitely Adjustable," stainless steel band clamp is far stronger than any hose clamp. Tough . . . vibration and corrosion proof . . . it can be applied or removed in seconds. Use it over and over again at varying diameters. The wide band prevents cold flow, a frequent cause of leakage. Marman T-bolt fastener provides fast, easy assembly . . . cannot slip or vibrate loose.

. . . For chemical, marine, automotive and a host of other applications.

Write, wire or phone Dept. CP-554

Place T-bolt through hole nearest required diameter—then fold strap under and tighten with wing nut.

**TO ORDER—SPECIFY "SERIES 859" CLAMP**  
Dia. 1¼" to 2¾"  
Dia. 2½" to 4½"  
Dia. 4¾" to 6"

THERE IS A MARMAN  
CLAMP OR COUPLING  
AT EVERY  
GOOD JOINT

**MARMAN**  
PRODUCTS CO., Inc.  
11214 EXPOSITION BLVD  
LOS ANGELES 64, CALIF.

When inquiring check CP 8462 on handy form, pgs. 2-3

CHEMICAL PROCESSING



Pre-weighed material drops through bag chute. Filled weight drops bag onto moving conveyor which carries it through sewing head

series. Filled weight drops each bag onto a moving belt conveyor which carries them through sewing head.

Unit is said to be easy to install and maintain. Changeover takes but a few minutes, it being necessary only to change scale beam balance weights. Two men are sufficient for entire operation.

(Bag filling machine is distributed by Union Bag & Paper Corp., Dept. CP, 233 Broadway, New York 7, N. Y. . . . check CP 8463, pages 2 and 3.)

#### Sift-proof bags produced by tape-over sewing machine . . .

floor space of 4 x 9' taken by 36" high unit

**Uses:** Designed for use with manufacturer's multiwall tuber, machine sews one or both ends of multiwall bag.

**Features:** Machine is said to produce a sift-proof seal by applying selvage tape over sewing.

**Description:** With tape-over sewing, ends of tube are sewn first, then selvage is glued and applied over stitches, forming a sift-proof seal that is ideal for multiwall bags used for sugar, flour, cement, fertilizer, feed, insecticides and other fine materials, according to manufacturer.

Model S-3 sews multiwall bags ranging in size from 10 x 20" to 26 x 54", at 30-40 per min.

(Sewing machine is a product of Potdevin Machine Co., Dept. CP, 285 North St., Teterboro, N. J. . . . check CP 8464 on handy form, pages 2 and 3.)

## RICHARDSON

... helps make money from Chows for RALSTON PURINA

#### PROBLEM: ✓

Weighing up to 60,000 pounds of laying Chows per hour and bagging it in 50-lb. bags ACCURATE BY WEIGHT.

#### SOLUTION: ✓

Installation of one Richardson E-50 Duplex Bagging Scale. This versatile unit operates with two weigh hoppers . . . one loads while the other discharges. Speed—18 to 20 50-lb. bags per minute with consistently high accuracy.

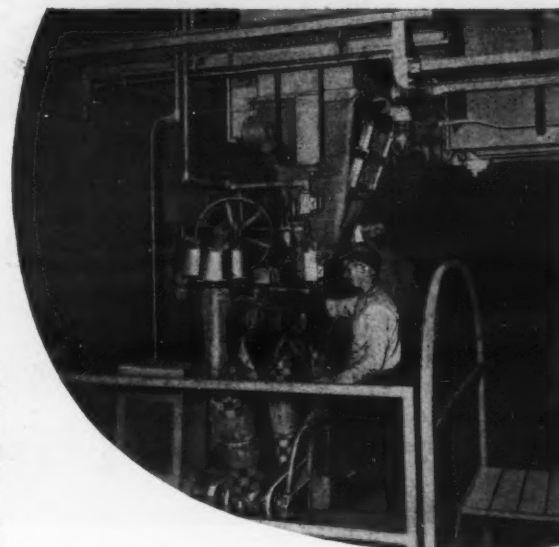
Ralston Purina Company, Bloomington, Illinois, one of the nation's leading processors of feedstuffs, does a high-volume business in cattle, hog, and poultry Chows. And to insure fast, accurate production, they consulted a Richardson engineer. He made a thorough production survey and recommended this installation—a labor-saving, cost-reducing Richardson E-50 Duplex Bagging Scale that guarantees high volume with consistently accurate weight.

Richardson has made a specialty of engineered materials handling by weight for more than fifty years. This practical experience in solving bagging, mixing, proportioning, and automatic weighing problems for every field of processing is available to you.

# Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

When inquiring check CP 8465 on handy form, pgs. 2-3



Call in a Richardson engineer, and at no obligation to you he'll gladly make a survey of your present operations. His suggestions can point the way to more consistently profitable operation.

Richardson Scale Co., Clifton, New Jersey. Feeder-Weigher Systems of All Types: Automatic Bulk-Weighing Hopper Scales, Including Conveyor-Feed Types • Continuous Feeder-Weighers • Automatic Bagging Scales • Bag Sewing Conveyors • Packers • Process Control Panels. Branch offices in: Atlanta • Buffalo • Boston • Chicago • Detroit • Houston • Minneapolis • New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal • Toronto.



with a LIQUIDOMETER

Tank Gauge

- FOR GAUGING LIQUIDS OF ALL KINDS
- 100% AUTOMATIC
- APPROVED BY UNDERWRITERS' LABORATORIES

WRITE FOR COMPLETE DETAILS

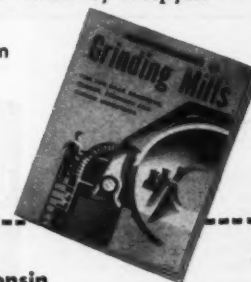
THE LIQUIDOMETER CORP.  
38-10 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 8466 on handy form, pgs. 2-3

## Get Complete Facts On... ROD MILLS BALL MILLS PEBBLE MILLS

Write for this useful 44 page book, bulletin 07B6718A. Full of helpful facts on:

- Grinding media action
- Mill applications
- Wet vs dry grinding
- Grinding circuits
- Critical mill speeds
- Grindability indices



ALLIS-CHALMERS  
Milwaukee 1, Wisconsin

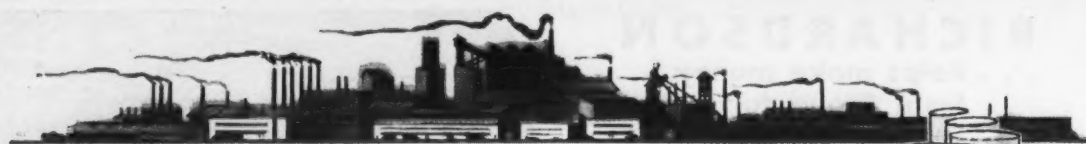
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Address.....  
City..... State..... A-4300

ALLIS-CHALMERS

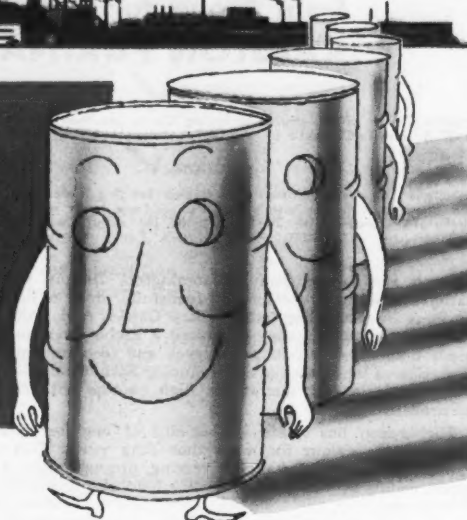


When inquiring check CP 8467 on handy form, pgs. 2-3



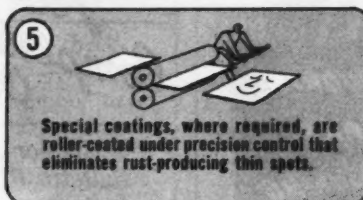
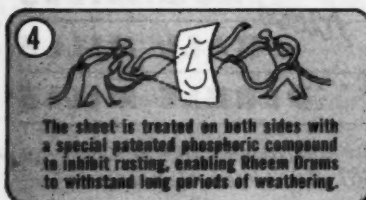
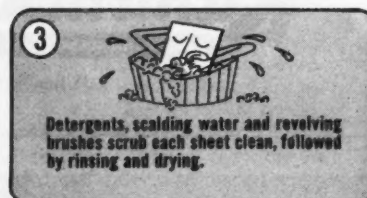


## Rheem Drums are built of Cleaner Steel for Longer Life!



### 6-STEP PREPARATION—

### BEFORE FABRICATION—MEANS SAVINGS FOR SHIPPERS!



### IMPORTANT TO SHIPPERS!

Rheem has a complete line of special drum linings for a variety of products. And if your product requires a different lining, each of Rheem's seven strategically-located container plants has complete laboratory facilities to help you. Rheem chemical engineers have solved container problems for many of America's largest shippers. Call or wire the office nearest you!



### Free Folder

Write today to the nearest Rheem Manufacturing Office listed below for your free copy of informative folder on Rheem Drums.



**RESULT OF RHEEM CARE** After more than a year and a half of continuous outdoor exposure, in an area of heavy rainfall and high humidity, Rheem drums are still in excellent condition... while ordinary spray-finished drums on test for the same length of time show signs of advanced deterioration.



### MANUFACTURING COMPANY

World's Largest Manufacturer of Steel Shipping Containers

Richmond, California • South Gate, California • Houston, Texas • Chicago, Illinois  
New Orleans, Louisiana • Linden, New Jersey • Sparrows Point, Maryland

When inquiring check CP 8468 on handy form, pgs. 2-3

### PACKAGING

**No 'solder tack' needed in mailing of paint cans when ring seal is utilized**

Faster and more economical handling is provided by ring seal that meets post office requirements for shipping filled paint cans through the mail. Formerly, plug top closures of paint cans had to be "solder-tacked" to cans before mailing. Seal is designed particularly for those who ship large volumes of paint by parcel post.



Tear tab on seal permits easy opening

Ring seal is crimped on over edges of container top and "locks" plug to can. Tear tab on ring is provided for easy opening.

(Ring seals are a development of American Can Co., Dept. CP, 100 Park Ave., New York 17, N. Y. . . . check CP 8469, pages 2 and 3.

### Depicts automatic scale for bagging fertilizer

Automatic scale for bagging fertilizer is pictured in 6-page bulletin. Three models are described. Bul 0552 is issued by Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. Specify CP 8470, pages 2 and 3.

# CUT COSTS

Pack Chemicals  
in VALVE BAGS  
with

## AUGER-MATIC

Fills and Weighs... All in One Operation



NO DUST

Cut production costs by packing your product in modern self-closing bags... the AUGER-MATIC Bag Packer fills them quickly to any weight desired... shuts off automatically.



NO WEIGHING

Valve Bags fit snugly on AUGER-MATIC spout so no dust escapes... keeps bags clean... eliminates costly tying or bag closing equipment.



NO SEWING...  
NO TIEING

AUGER-MATIC Bag Packer is equipped with multi-twist auger... packs any materials from powder to pellets. Easily moved from one filling point to another.

Send for descriptive literature

**E. D. CODDINGTON MFG. CO.**

5016 North 37th Street • Milwaukee 9, Wisconsin

### PACKAGING

**Plastic film sealer  
attains speeds to  
600 in/min...**

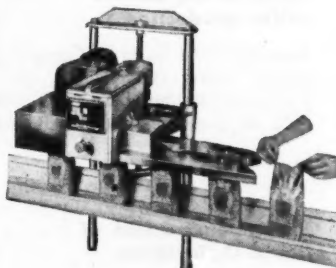
thermostat controls temperature of sealing roll

**Uses:** For fast production sealing of polyethylene, polythene, plicofilm, vinyls and similar plastic bag materials.

**Features:** Film of 1½ mil thickness can be sealed at speeds up to 600 in/min, 2 mil thickness between 400 and 500 in/min, and 3 to 4 mils between 200 to 300 in/min.

**Description:** Bags inserted in the easily-fed opening of feed wing are gripped at tops between two endless fabric rubber belts and conveyed through rolls where seal is made. Belts do not come in contact with any heated surfaces and therefore remain cool.

Heated aluminum roll operates against a cool roll of silastic rubber. Plastic film is melted at point of roll contact, resulting in a welded seal about 1/8" in width. To prevent melted film from stick-

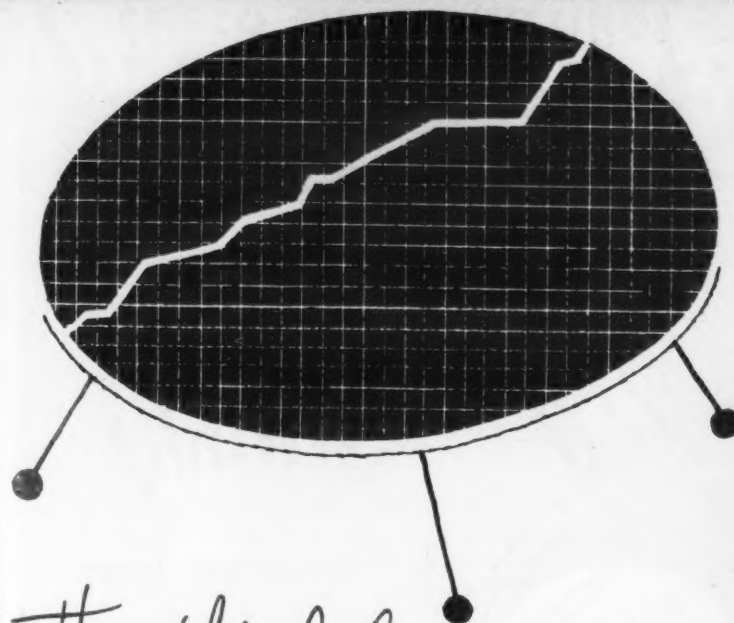


Heat sealer is available for bench or table mounting

ing to heated roll, sealing surface of roll is continuously coated with a thin film of mold release fluid which is wick fed from a receptacle attached to underside of guide bars. This fluid is fed to the roll only when sealer is in operation, only uses fluid when seal is made.

Temperature of sealing roll is automatically controlled by a bulb thermostat, dial for making desired temperature setting being located on front of machine.

(Heat Sealing Machine is a product of Pack-Rite Machines, Div. of Techtman Industries, Dept. CP, 407 E. Michigan St., Milwaukee 1, Wis. ... or for more information check CP 8472, pages 2 and 3.)



*The third leg  
of your sales table...*

The sales success of your product rests on a sort of three-legged table:

1. A good, saleable product.
2. Good distribution and advertising support.
3. A good shelf package, with BUY-APPEAL.

You're taking care of the first two points. But the third leg...

*That's us!*

Your product needs the BUY-APPEAL it gets from Bemis Consumer-size Paper Bags, with the brightest, crispest printing your brand ever had.

With increasing self-service, the value of Bemis Packaging has multiplied. Ask your Bemis Man for the complete story.



Flexi-Carton



Pinch-Bottom Bag

# Bemis



General Offices—St. Louis 2, Mo.  
Sales Offices in Principal Cities

When inquiring check CP 8473 on handy form, pgs. 2-3

When inquiring check CP 8471 on handy form, pgs. 2-3

MAY, 1954





### THE VERSENE® SECRET

#### ONE IS NOT ENOUGH

No one Chelating Agent (not even *Versene*) can do all Chelating (complexing) jobs equally well under all conditions. Although the general impression may be otherwise, the fact remains that *one is not enough*. Bersworth, with more than a generation of experience in pioneering Chelate Chemistry has known this "secret" for a long time.

#### IT TAKES FIVE

Because one is not enough Bersworth has developed a complete line of Chelating Agents which includes *five basic Versenes* and eleven additional *Versene Compounds*. Together they cover the entire chelation range but separately each is designed to do a special job within specific limits of that range. Hence, when you want *maximum chelating efficiency* at *minimum chelating cost* it is important for you to let us help select the *one right Versene* for your particular problem.

#### KEYED TO CHELATION

The quality of the Versenes is unduplicated and the uniformity of their chelating power is guaranteed. All are exceptionally stable at high temperatures throughout the pH range. Made only by the Bersworth Chemical Company under patents and processes originated and developed by F. C. Bersworth, the Versenes are *keyed to chelation*. Find out now *which Versene* is yours. Send for samples and Tech. Bulletin No. 2, Chemical Counsel if desired.



*"Chemistry's most precise chemicals"*  
**BERSWORTH CHEMICAL CO.**  
 FRAMINGHAM, MASSACHUSETTS

#### WAREHOUSE STOCKS

Chas. S. Tanner Co.  
 Liberty Life Bldg.  
 Charlotte, N. C.

Siegel Chemical Co.  
 One Hanson Place  
 Brooklyn 17, New York

Barada & Page, Inc.  
 Houston, Dallas, Corpus Christi,  
 New Orleans, St. Louis, Wichita,  
 Oklahoma City, Tulsa, Kansas City, Mo.

Kraft Chemical Co., Inc.  
 917 West 18th Street  
 Chicago 8, Illinois

George Mann & Co., Inc.  
 251 Fox Point Boulevard  
 Providence, Rhode Island

#### WEST COAST AGENTS

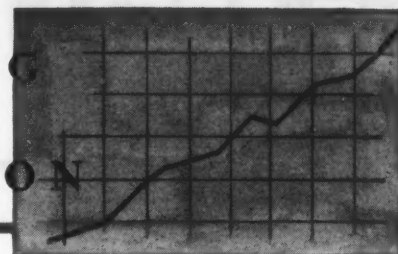
Van Waters & Rogers, Inc.  
 Seattle, Wash. & Portland, Ore.

Braun-Knecht-Heimann Co.  
 San Francisco, California

Braun Corporation  
 Los Angeles, California

When inquiring check CP 8474 on handy form, pgs. 2-3

## EXPANDING CHEMICAL PRODUCTION



#### Expands tall oil product production by 2 1/2 times

Arizona Chemical Company, a jointly owned subsidiary of American Cyanamid Company and International Paper Company, has voted expansion of plant facilities at Panama City, Florida. Addition will increase separating and refining facilities by two and one-half times. Substantial part of this increase will be in tall oil fatty acids and tall oil rosins.

Engineers are Stone & Webster Construction Company's Badger Division. Completion date is set for mid-1955.

#### South of the border sulfur production

Mexican Gulf Sulphur Company has completed plant construction at their San Cristobal Dome holdings. The sulfur will be produced by the Frasch process.

#### Starts construction of liquid O<sub>2</sub> facilities

National Cylinder Gas Company begins construction of \$3.5 million facilities for manufacturing liquid oxygen. An 8-acre tract on Chicago's south side has been selected.

#### Boost pyridine output

Productive capacity of Pittsburgh Coke & Chemical Company's pyridine plant has been doubled, manufacturer announces.

#### Completes 450-ton per day ammonia unit

Phillips Chemical Company, a wholly-owned subsidiary of Phillips Petroleum Company, has started up a 450-ton per day anhydrous ammonia unit at Adams Terminal, on the

Houston Ship Channel. Plant will take 26 million cu ft per day of natural gas from Phillips reserves in nearby Chocolate Bayou field. Equipment has been installed to eliminate any air pollution from the installation.

#### Represents about 10% increase in nation's ethylene output

Ethylene plant, largest of its kind to date, will be erected at Gulf Oil Corporation's Port Arthur, Texas, refinery. Unit will have a capacity of three billion cu ft per year of ethylene gas, representing about a 10% increase in nation's ethylene production. It will more than double refinery's present capacity. Completion is scheduled for early 1955.

#### Paint drier plant for West Coast

San Francisco Bay area is proposed site for new paint drier manufacturing plant, announces Advance Solvents & Chemical Corp. of New York City.

#### Expand "Ethyl" production by 15 per cent

By expanding chemical production at their Baton Rouge and Houston plants, Ethyl Corporation will increase capacity for producing "Ethyl" antiknock compounds by 15 per cent. A 12-month completion date has been set.

#### Enlarges production and sales facilities

Dixon Corporation, Bristol, R. I., announces extensive enlargement of production and sales facilities. Company molds and extrudes Teflon and other fluorocarbon plastics.

Increases  
of dried

Product  
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Witco  
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M. W.  
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Triple  
capa

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and s  
dippi

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chem

Rohr  
const  
plan

### **Increases production of driers**

Production of naphthenate, octoic, and tall oil driers at the Chicago plant of Witco Chemical Company is being increased and streamlined by the addition of a new operating wing.

### **Fluid hydroformers 50% completed**

M. W. Kellogg Company-designed fluid hydroforming units are now about 50% completed at Cities Service, East Chicago, Indiana, and Lake Charles, Louisiana, refineries. Units will have design capacity of 12,800 and 17,200 bpd, respectively, when put on stream this summer.

### **Epoxy resin plant on stream**

World's largest epoxy resin plant has gone on stream at Houston, Texas. Plant will triple Shell Chemical Corporation's production of Epon resins, used in surface coating and structural fields.

### **Alumina from Jamaica bauxite refined in Texas**

Located on Corpus Christi Bay, the La Quinta alumina plant of Reynolds Reduction Company, subsidiary of Reynolds Metals Company, is now substantially completed. Output per day is 1000 tons.

### **Triples production capacity**

Federal Latex Corp., Brooklyn, N. Y., has installed compounding and storage facilities which triple production of natural and synthetic compounds for latex foam, dipping, laminating, impregnating.

### **Start construction of Canadian chemicals plant**

Rohm & Haas Company announces that construction of a Canadian chemicals plant is underway. Rohm & Haas Com-

pany of Canada Ltd., a wholly-owned subsidiary, will manage the new plant. Site is at Scarboro, near Toronto.

### **Titanium dioxide plant for Georgia**

Now under construction at Savannah, Georgia, is American Cyanamid Company's new titanium dioxide plant. Plans are to turn over Cyanamid's Gloucester City, New Jersey, plant to The New Jersey Zinc Company when the Southern plant has been placed in operation.

### **Plastics plant will open this summer**

Initial output of 1½ million pounds of rigid plastics is expected to start flowing from Seiberling Rubber Company's new plant during its first year of operation. Constructed at Newcomerstown, Ohio, the one-story plant opens this summer.

### **Will enter polyethylene field with proposed expansion**

Chemical Division of Koppers Company, Inc., has announced plans to expand into production of polyethylene by mid-1955. Polyethylene will be produced in pelletized form and in a variety of grades.

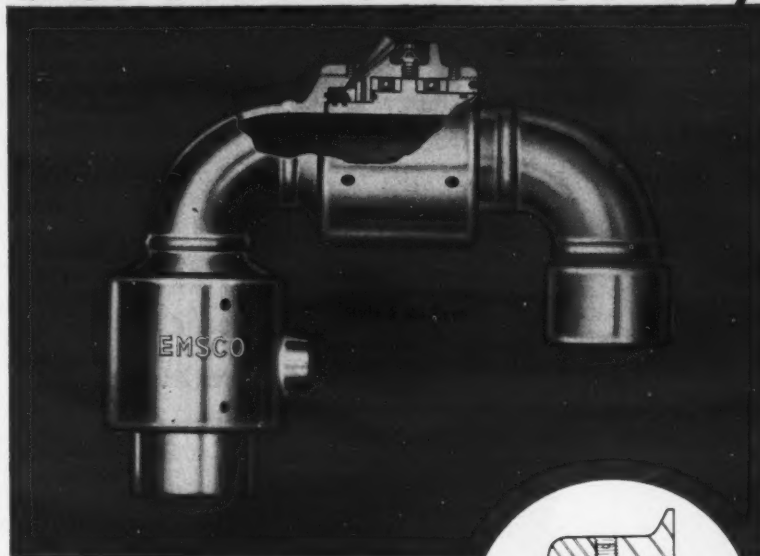
### **Lab expands research to include rubber and petroleum**

As a result of increasing use of company's fatty acids and fat-derived chemicals by the rubber and petroleum industries, Armour and Company has expanded its Chemical Division's laboratory facilities to include research sections in these fields.

### **Caustic soda and chlorine plant starts operation**

Twelve million dollar caustic soda and chlorine plant started operation on March 17, at Montague, Michigan. Owned by Hooker Electrochemical Co., plant makes liquid chlorine, 50% and 73% liquid NaOH.

## **EMSCO SWIVEL FITTINGS LAST LONGER — here's why**



### **UNIQUE DESIGN PERMITS EASY MAINTENANCE WHILE IN OPERATION**

Three basic advantages of the Emsco Ball Bearing Swivel Fitting are:

1. FREE TURNING
2. EFFICIENT PACK-OFF
3. LONG LASTING

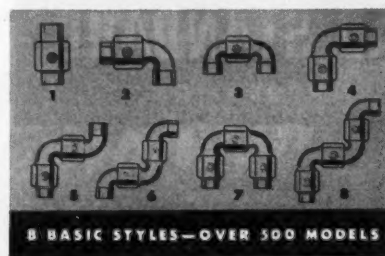
An Emsco Swivel Fitting is practically unexpendable for the reason that, after long service, both the packing and the ball races are easily adjustable and replaceable. This means no discarded fittings—no costly return to the factory for repairs.

Emsco "free turning" Ball Bearing Swivel Fittings are manufactured for almost every type of service, from high vacuum to pressures of 15,000 psi., and from sub-zero temperatures to 750°F. Complete information, prices and delivery upon request.



Deformable packing extruded into annular grooves assures a positive seal. This Emsco patented method does not affect ease of turning. Any packing material such as asbestos, Blue African Asbestos or Teflon may be used in the US Type fitting.

Fittings using a lip type packing are available as Type HS or HP, depending on pressure involved



8 BASIC STYLES—OVER 500 MODELS

# **EMSCO**

**MANUFACTURING  
COMPANY**

BOX 2098, TERMINAL ANNEX  
Houston, Texas • LOS ANGELES 34, CALIF. • Garland, Texas

When inquiring check CP 8475 on handy form, pgs. 2-3



**WHATEVER YOU PROCESS . . .**

**FROM PLASTICS TO  
PHARMACEUTICALS, YOU CAN  
RELY ON READ STANDARD MIXERS  
FOR TOP LEVEL DEPENDABILITY**

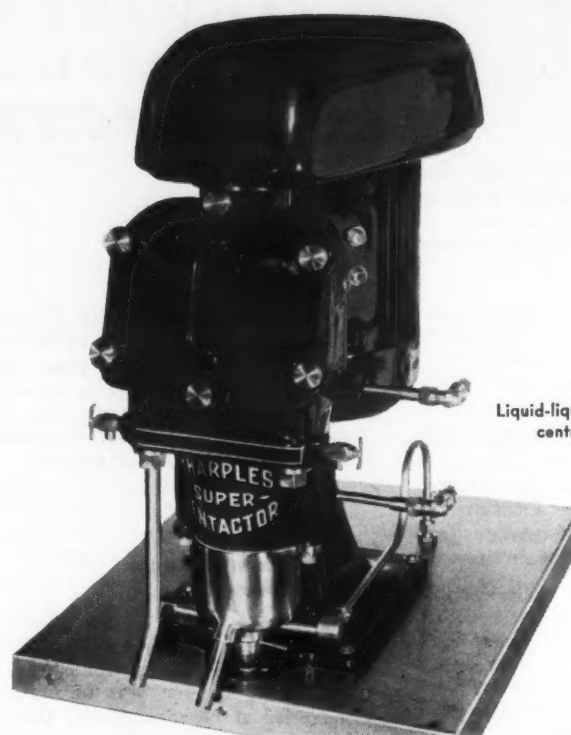
*Heavy Duty Double-Arm Mixers* in rotating and stationary bowl models . . . for atmospheric, reduced, or elevated pressures . . . with single, multiple, or variable-speed drives and temperature controlling jackets . . . overlapping mixing arms . . . sigma and other type mixing arms . . . working capacities one quart to 1500 gallons. • *Laboratory Mixers* for the most exacting types of laboratory mixing . . . built in working capacities of one, three, six and 20 quarts. • *Vertical Mixers*, planetary action for processing of dry materials, emulsions, and light plastic masses . . . complete line with multiple beater speeds and designed to accommodate several sizes of bowls . . . many auxiliary attachments available . . . 12 to 175 quarts. • *Spiral Ribbon Mixers* for continuous or batch blending and mixing of pulverized, granular dry or wet materials . . . operation under pressure or full vacuum . . . with or without temperature controlling jackets . . . working capacities one to 500 cubic feet.

**READ STANDARD**  
CORPORATION

BAKERY-CHEMICAL DIVISION:  
PHILADELPHIA, PENNSYLVANIA • LOS ANGELES 39, CALIFORNIA

When inquiring check CP 8476 on handy form, pgs. 2-3

**processing  
equipment**



Liquid-liquid countercurrent centrifugal extractor

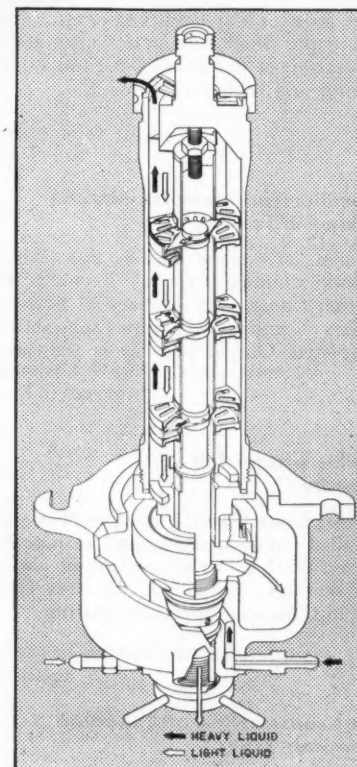
## **Rapid liquid-liquid extraction with centrifugal unit**

**Countercurrent extractor has 80 gph capacity, attains up to 100% stage efficiency**

**Uses:** Chief application is liquid-liquid extraction with systems of two immiscible liquids. Eighty gph capacity makes machine suitable for small-scale production or pilot plant work. However, almost instantaneous extraction permits processing of samples as small as one gallon.

**Features:** Bowl operates at atmospheric pressure. Gravity feed is satisfactory for low flow rates. Operating speed is reached in several seconds, and extraction takes place almost instantaneously.

Location of interface between liquids is maintained mechanically and can be varied. Unit



Cross-sectional view of unit, showing flow of heavy and light liquids

CHEMICAL PROCESSING

can be disassembled

**Description:** counter-current, a 1½ hp driving assembly in the tube on a stationary in the motor in the section, liquid is section,

As light the baffles then flow liquids a separating zone over a collector leaves through

Maximum gph (static) 15,800 Efficiency in many efficiencies between unit's of flow variation

The volume can be liquid-liquid flows are automatic was initiated

Extraction is necessary

(Superior Corporation) Fourth Edition

**Pulverizer in 30-**

Full are verified hand which uct. incl. Mak are

"Pulverizer" Pulverizer Per 847

MAY, 1964

can be disassembled, cleaned or modified, and re-assembled in less than five minutes.

**Description:** Super-Centactor is a centrifugal countercurrent liquid-liquid extractor, powered by a 1½ hp electric motor drive. Mixing and separating assemblies of one to five stages can be placed in the tubular bowl. Mixing blades are mounted on a stationary shaft. Special baffles incorporated in the mixing zones and liquid-accelerating vanes in the separating zones rotate with bowl. Heavy liquid is fed through shaft into bottom mixing section, while light liquid is fed into top section.

As light liquid enters the mixing zones through the baffles, it mixes with heavy liquid. Mixture then flows both ways through baffles, and the two liquids are separated by high centrifugal force in separating zones located above and below the mixing zones. Light liquid leaves at bottom of bowl over a ring dam and flows out by gravity through a collector at bottom of frame. Heavy liquid leaves over ring dam at top of bowl and flows out through top collector.

Maximum total liquid throughput of unit is 80 gph (standard system). Rotational speed is from 15,800 rpm (6000 g) to 23,650 rpm (14,000 g). Efficiencies are said to vary with throughput, but in many systems optimum flow exists where 100% efficiency can be obtained. Volumetric flow ratios between the two phases have little effect upon unit's operation. Interface location is independent of flows and will remain constant regardless of variations in other operating conditions.

The volumetric flow ratios between the two liquids can be varied without affecting the location of the liquid-liquid interface, which is automatically established by preset ring dams. Only the liquid flows need to be monitored, as all other factors are automatically fixed by manner in which bowl was initially assembled.

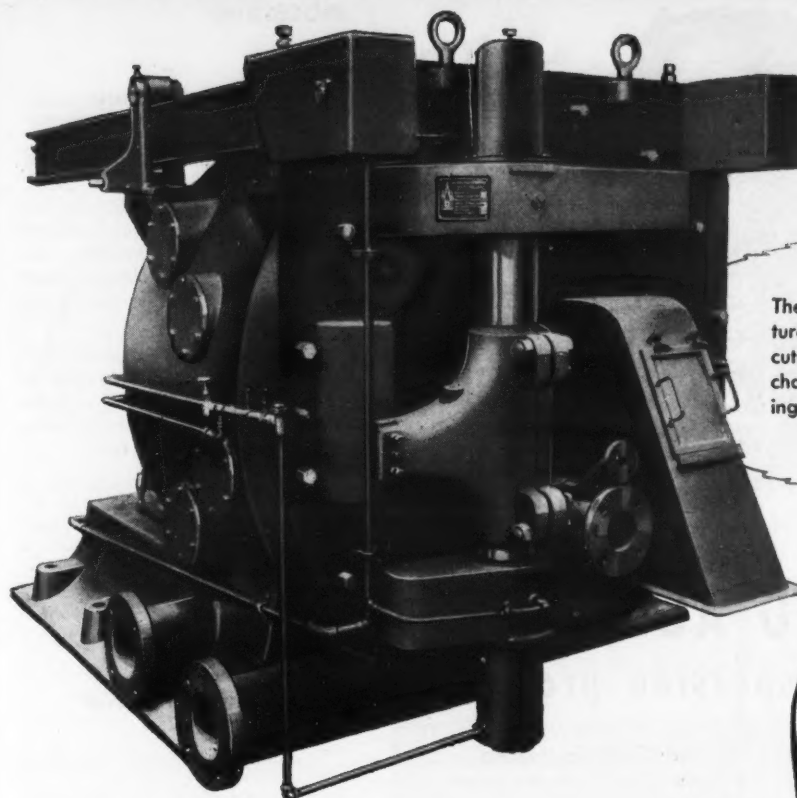
Extractor uses no rotating seals. Lubricated bearings never come in contact with fluids being processed. Bowl construction is of stainless steel.

(Super-Centactor is product of The Sharples Corporation Research Laboratories, Dept. CP, 424 W. Fourth St., Bridgeport, Pa. . . or for more information check CP 8477, pages 2 and 3.)

#### **Pulverizers, feeders discussed in 30-page catalog**

Full-page photographs and engineering drawings are highlights of 30-page catalog covering pulverizers and feeders. Feeders are designed to handle damp, oily, difficult-to-feed materials, while pulverizers can handle wide variety of product. Various models are shown. Descriptions include dimensional and detailed information. Maker's pilot rental feeder and free testing service are explained.

"Pulva-Sizers and Com-Bin Feeders" is issued by Pulva Corporation, Dept. CP, 550 High Street, Perth Amboy, N. J. When inquiring specify CP 8478 on handy form, pages 2 and 3.



The 50" Reineveld Centrifuge features the Roll-Out Front Cover which cuts the "down" time needed for changing of the filter cloth or replacing of a dull cut-out knife.

## **Consider ALL of these Factors when You Compare Centrifuges**

COMPARE THE REINEVELD CENTRIFUGE with any other centrifuge of its type . . . on the points listed above or on any other factor you choose.

See for yourself why the Reineveld Centrifuge is your best buy . . . from any angle.

The experienced engineers and complete laboratory facilities of Heyl & Patterson are available to determine the value of a centrifuge in your application and to recommend the most economical and efficient use of centrifugal equipment.

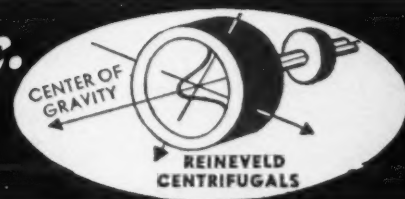
**Booklet 6-RC-3 can help you judge the Reineveld Centrifuge for yourself.  
Write for your copy today.**

**Initial Cost**  
**Production Capacity**  
**Amount of Filtering Surface**  
**Materials of Construction**  
**Weight**  
**Amount of Vibration**  
**Maintenance Costs**  
**Quality of Filter Cake**  
**Ease of Cleaning**  
**Versatility**

# **Heyl + Patterson, Inc.**

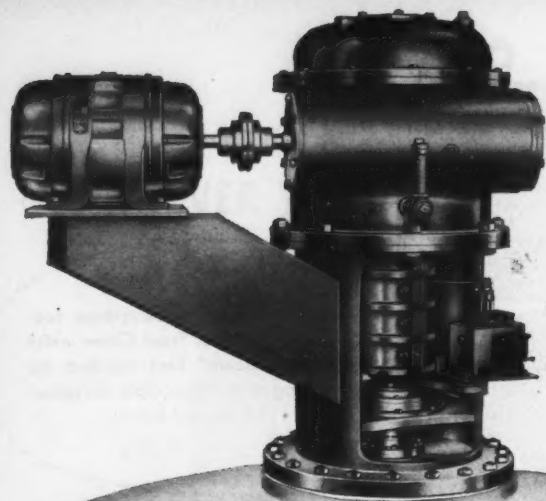
"SINCE 1887"

55 FORT PITT BLVD. PITTSBURGH 22, PA.



When inquiring check CP 8479 on handy form, pgs. 2-3





## NETTCO ENGINEERED AGITATOR speeds gas dispersion process

Another product of Nettco equipment and Nettco engineering — a tank-top Model WT-47 Agitator Drive with 15 HP explosion proof motor driving two Nettco split turbines on a shaft over 17 feet long! Specifications allowed for no internal tank bearings. Solids would run up to 40% maximum . . . operating pressures would range all the way from 30 in. vacuum to 39 psig. The problem of designing, engineering, and building the agitator to do this job was entrusted to Nettco.

Result . . . a Nettco engineered product from top to bottom . . . designed and built for efficiency, durability, and ease of service and inspection. Because all major components are standardized Nettco units, the customer gained important economies, despite the special features of the installation.

Let Nettco help solve your agitating problems! We'll be glad to quote on your requirements. New England Tank & Tower Company, 93 Tileston St., Everett 49, Mass.

# NETTCO

ENGINEERED AGITATION

When inquiring check CP 8480 on handy form, pgs. 2-3

## PROCESSING

### Features technical data on shredders

Swing hammer shredders used in chemical, pulp and paper, sugar and other industries are described in 56-page illustrated catalog. Three shredders are listed. Shredder selection guide recommends specific models for certain industries.

Photographs and technical drawings reveal construction of units and show use. Catalog includes 8-page insert consolidating technical data on shredders.

Cat 855 is issued by The Jeffrey Mfg. Co., Dept. CP, 956 N. 4th St., Columbus 16, Ohio. When inquiring specify CP 8481, pages 2 and 3.

### Positive sludge removal with separator . . .

eliminate nozzle plugging

**Uses:** Unit can be used for continuous removal of solids from liquids, three-phase separations (two liquids and one solid), and dewatering heavy slurries.

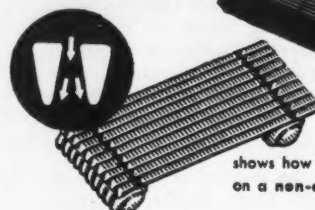
**Features:** Advantages are positive sludge removal, relatively dry solids discharge, and elimination of clean-up labor.

**Description:** Continuous desludger is an attempt to approach theoretically perfect centrifuge (one which continuously discharges dry solid and completely clarified effluent).

Products to be separated are gravity fed into top and enter separating bowl. Liquid fractions move inwardly through set of discs where they are freed of all solids and individually discharged. Solid components gradually build up on bowl periphery and are periodically purged by automatic discharge. While feed is momentarily shut off, sludge discharge channel opens, releasing all collected solids. Sludge discharge channel is automatically closed and feed restored.

Design eliminates build-up of solids between nozzles or in other dead areas, as may be the case with conventional bowl separators. Bowl dismantling for cleaning is unnecessary. Usual procedure is

## Kleenslot THE IDEAL SCREEN FOR DEWATERING AND SIZING!



Cross section at left shows how KLEENSLOT Screens operate on a non-clogging principle.

IT CAN BE ADAPTED TO FIT ANY MAKE OF VIBRATOR. It is not necessary to change your present machine to accommodate our screen.

KLEENSLOT WEDGE WIRE VIBRATOR SCREENS are of quality construction and built to give maximum long-life service. The rigid construction and method of installation prevents "whipping".

The wedge shape of the screen wire with its non-clogging, non-blinding features permits perfect separation on wet or dry screening and the rigid construction adds considerable to its capacity and efficiency when used in vibrator applications.

SEND FOR  
OUR  
ILLUSTRATED  
CATALOG

Wedge-Wire  
CORPORATION

GAS ST. AT NICKEL PLATE R.R., WELLINGTON, OHIO

When inquiring check CP 8482 on handy form, pgs. 2-3

## MORSE DeLUXE 500 Portable ROTATOR

- MIXES
- BLENDS
- TUMBLES
- CLEANSSES



### Faster and at less cost!

The patented Morse De Luxe 500 Rotator will handle 1 to 55 gal. containers, weighing to 500 lb. They revolve safely, smoothly, efficiently at 10, 20, 40 rpm on this powerful, compact, portable, motorized unit. Cuts cost of mixing, blending, tumbling, cleansing. Easily moved and loaded by one man. Has 3/4" dia. power driveshaft with self-aligning ball bearings. Four adjustable 4" dia. Neoprene-tread drive wheels. Fully enclosed worm-gear drive with 30-1, 15-1, 7 1/2-1 reductions. Weighs 137 lb. Delivered complete with motor, drive mechanism and tipping lever. Write for Bul. #1053 and catalog, showing full Morse line of Drum and Barrel handling equipment.

MORSE MANUFACTURING CO. INC.

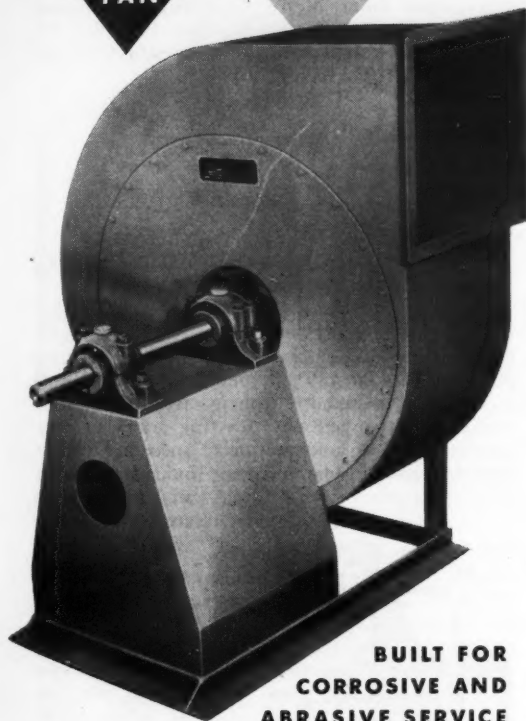
757 West Manlius St. East Syracuse, N. Y.

When inquiring check CP 8483 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## FOR EXHAUSTING CORROSIVE FUMES

USE THIS  
RUGGED  
FAN



**BUILT FOR  
CORROSIVE AND  
ABRASIVE SERVICE**

Furnished in a wide variety of sheet lining materials — or lighter protective coatings to fit your requirements.

Fan and housing constructed of extra heavy metal especially for lining applications.

All units statically and dynamically tested after lining application — assuring dependable long-life performance.

Consult a Heil Engineer for complete engineering service for your corrosive and ventilating requirements on solid plastics or lined steel Exhaust Hoods, Ducts and Stacks.

Write Dpt. CPM for additional data on our complete line of Chemical Proof Equipment



**HEIL PROCESS EQUIPMENT CORPORATION**

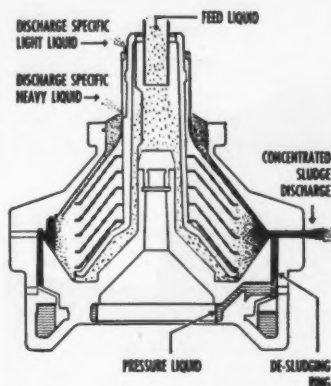
14903 Simms Avenue • Cleveland 11, Ohio

Representatives in all Principal Cities

When inquiring check CP 8484 on handy form, pgs. 2-3

MAY, 1954

## PROCESSING



Cross-section of de-sludging bowl

to flush bowl with water or sterilizing medium. This is done by valve operation and takes about 5 to 10 minutes.

External control is provided for regulation necessary to compensate for varying solids percentage in slurry.

(Continuous SAOG-design de-sludger is product of Centrico, Inc., Dept. CP, 75 West Forest Ave., P.O. Box 349, Englewood, N. J. . . . or for more information check CP 8485 on handy form, pages 2 and 3.)

### Distillation equipment, services outlined

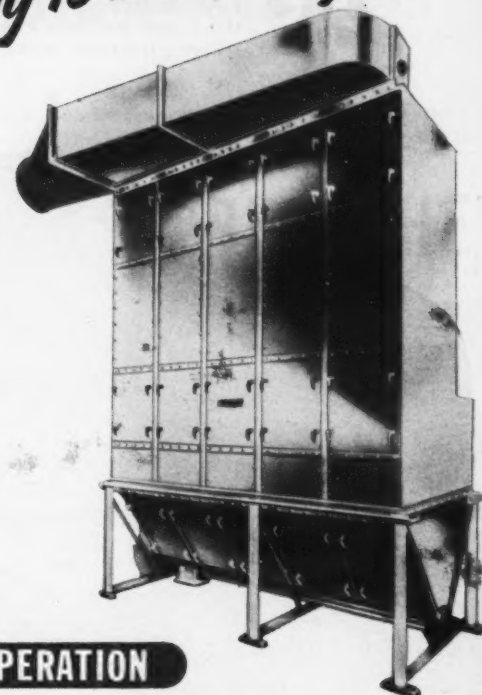
Columns, exchangers, reboilers, auxiliaries, and controls used in distillation operations are covered in recently issued booklet.

Products include a 20-plate stainless steel fractionator with internal reboiler, monel acid stripper with carbon steel skirt, tar acid distillation column of stainless steel, and carbon steel solvent separation column equipped with trays. Photographs and text explain operation and design.

Available engineering services, covering fields of fractionation, thermal design, and fabrication, are described.

Booklet is issued by The Colonial Iron Works Company, Dept. CP, 17643 St. Clair Avenue, Cleveland 10, Ohio. When inquiring specify CP 8486 on handy form which is located between pages 2 and 3.

# The Swing is Definitely to The SIMON SUCTION FILTER DUST COLLECTOR for...



## DEPENDABLE OPERATION

. . . Each filter sleeve group is automatically and continually cleaned in sequence, maintaining **UNIFORM AIR FLOW** at all times. No separate, expensive filter cleaning equipment is required.

## SIMPLIFIED MODERN DESIGN

. . . exclusive aluminum construction provides ease of cleaning and minimum maintenance . . . all collecting ledges are eliminated . . . all parts are easily accessible. A **TRULY MODERN DUST COLLECTOR!**

## YOU SAVE WITH THESE FEATURES:

- high air to cloth ratios . . . 10 to 15 CFM per sq. ft. of cloth surface
- long filter cloth life . . . vertical agitation of the sleeve assemblies assures thorough cleaning without flexure
- only ¾ HP required for cleaning filter surfaces . . . up to \$1000 per year or more is saved in power requirements.
- \$\$\$ A SIMON SUCTION TYPE FILTER COSTS NO MORE THAN A PRESSURE TYPE UNIT \$\$\$

Without obligation, we shall be glad to show you how this equipment can be applied to your plant . . . most efficiently . . . most economically.

### ENTOLETER DIVISION

The Safety Car Heating and Lighting Company, Inc.  
1183 Dixwell Ave. — New Haven 4, Conn.

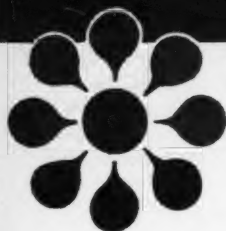
The trademark "ENTOLETER" is your guarantee of complete satisfaction.

When inquiring check CP 8487 on handy form, pgs. 2-3





One of six 51-foot liquid chlorine horizontal storage tanks built and tested by Newport News to meet A.S.M.E. Code requirements. This pressure vessel was welded by Union melt machines. Pressure vessels undergo stress-relieving treatment in our ovens.



## Large Units...

### single or multiple

*Built with careful attention to detail  
by specialists in Metal Fabrication*

Whether specified in alloyed or carbon steel, stainless, high nickel alloys or clad... you'll find it pays to have Newport News fabricate your large units.

Avail yourself of the specialized production techniques, and the skill of Newport News craftsmen operating vast steel fabricating shops.

Units of large dimension are readily constructed by Newport News in a 225-acre plant that includes five huge, fully equipped machine shops, drop forging and die facilities, heat treating ovens, and

acres of brass, iron and steel foundries.

Moreover, modern testing apparatus, used for thorough investigation of materials and techniques, contributes to the excellence of Newport News fabrication. In addition, Newport News shop erection of fabricated units assures trouble-free assembly at your plant site.

Let us bid on your present or future projects. If you are not familiar with the way Newport News can help you, write for our booklet entitled "*Facilities and Products*"... it's yours for the asking.



**Newport News** Shipbuilding and Dry Dock Company  
Newport News, Virginia

When inquiring check CP 8488 on handy form, pgs. 2-3

## PROCESSING

### Describes centrifuge operation

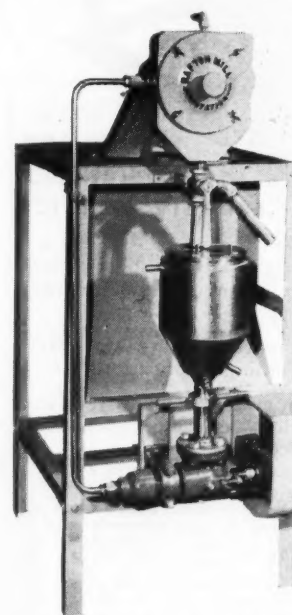
How to obtain high capacity at low cost in classification or concentration of suspended solids is explained in bulletin. Photographs, cut-away illustrations, and engineering data show how continuous centrifuges operate. Separations requiring hours with conventional means can be made in matter of seconds.

Continuous centrifugal separator bulletin is available from Merco Centrifugal Company, Dept. CP, 150 Green St., San Francisco 11, California. When inquiring specify CP 8489 on handy form, pages 2 and 3.

### "Shock treatment" applied to liquid in mill...

affects physical characteristics and reaction rates of liquids and solids in them

**Uses:** Suggested uses include: modifying properties of slurries or flowable suspensions; altering physical characteristics of solids capable of being incorporated in liquid; changing viscosities of solutions or liquid suspensions; affecting degree of polymerization of organic polymers; speeding reaction rates of slow organic reactions; influencing course of reaction in processing biologicals.



Mill modifies properties of slurries

Conditioning ground, fibrous, cellular components of plant or animal origin so that oils, fats, or other ingredients may be more readily separated; accomplishing by shock, reactions which do not now take place; controlling course of catalysis.

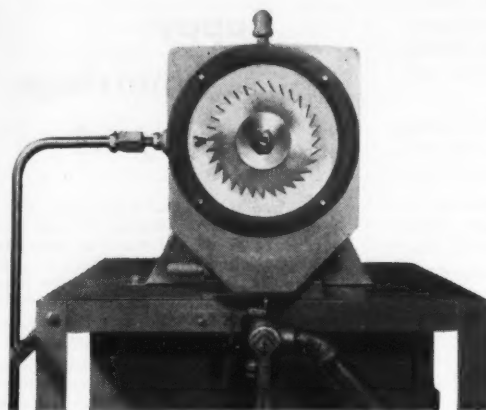
**Features:** Device applies "shock treatment" to liquid. Jet of liquid, pumped through nozzle, is struck with great force by teeth of rapidly rotating circular saw.

Liquid may be clear, or may be a flowable suspension carrying any desired content of solid particles.

Profound changes may be brought about in liquids and in solids carried in liquids. Modified starch is so changed that its adhesive strength is increased from 10 to 25%, depending on starch used. Saponi-

fication reactions proceed at higher rate when mixtures are run through mill.

**Description:** Laboratory mill handles about one to two and one-half quarts of liquid per minute, depending on viscosity. Feed-vessel capacity is approximately four and one-half quarts. Vessel is jacketed for water cooling. Saw is five inches in diam, about 3/16 inches thick and has 31 teeth.



View of mill with cover removed, showing nozzle (left) and circular saw

Advancing faces of teeth are radial and in horizontal position parallel to jet when they strike jet. Speed of saw is approximately 17,000 rpm.

Nozzle has 0.0595 inch diam orifice. Saw is operated by 2-hp, 3450-rpm, single-phase motor. Moyno pump has synthetic rubber stator and uses 3/4-hp, 1725-rpm motor. Metal parts of mill, which come in contact with liquids, are constructed of stainless steel. Net weight of unit is about 350 lb.

Process worked out with laboratory mill can be duplicated on commercial size mill in any tonnage quantities.

(Rafton Mill is product of Rafton Engineering Corporation, Dept. CP, P.O. Box 8, Shawsheen Village Station, Andover, Mass. . . . or for more information check CP 8490 on handy form, pages 2 and 3.)

#### Illustrates the operation of legless condensers

Four-page, two-color bulletin shows complete line of floor-mounted, direct-contact barometric condensers. Included are cut-away sections illustrating condensing process and showing vapor and condensing water flows.

Usual barometric leg (32 to 34 ft) is eliminated in condensers through use of pump which removes spent condensing water from reservoir in bottom of unit.

Form 9041 is available from Ingersoll-Rand Company, Dept. CP, 11 Broadway, New York 4, New York. Specify CP 8491, pages 2 and 3.

TRADE PAPER EDITION

Published by  
**SCHUTTE and KOERTING**  
Company



# ENGINEERING

JET APPARATUS • HEAT TRANSFER EQUIPMENT • STRAINERS • CONDENSERS AND VACUUM PUMPS • OIL BURNING EQUIPMENT • ROTAMETERS • FLOW INDICATORS • RADIAFIN TUBES • VALVES • SPRAY NOZZLES AND ATOMIZERS • GEAR PUMPS • DESUPERHEATERS

## JET HELPS ACID TANKS "BREATHE"

From CHEMICAL AND ENGINEERING NEWS

American Chemical Society

Vol. 29, Page 410, January 29, 1951

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Proper venting of storage tanks containing fuming sulfuric acid, or oleum, can present a serious problem in a chemical plant. The escaping sulfur trioxide tends to clog the vent and build up pressure in the

tank. At best, the fumes escaping are a source of atmospheric pollution.

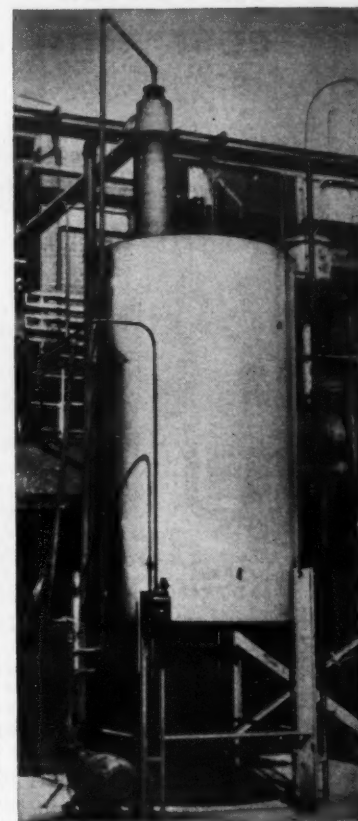
The Hilton-Davis Chemical Co. division of Sterling Drug Co. at Cincinnati, Ohio, found an ingenious solution to this problem. The 12,000-gal. oleum tank was vented through an SK Haveg Fume Scrubber installed on an adjoining tank containing 93% sulfuric acid. A pump supplied the jet with 93% sulfuric acid from the tank. Noxious fumes from the oleum are piped to the Fume Scrubber inlet and the circulating 93% acid effectively absorbs the sulfur trioxide. The system has proved highly successful in keeping the vents clear and eliminating atmospheric pollution.

Similar installations have been used to absorb fumes from such reactions as sulfide reductions, chlorosulfonic or oleum sulfonations.

For complete details on all types of SK Fume Scrubbers and their characteristics, write for Bulletin 4-R.

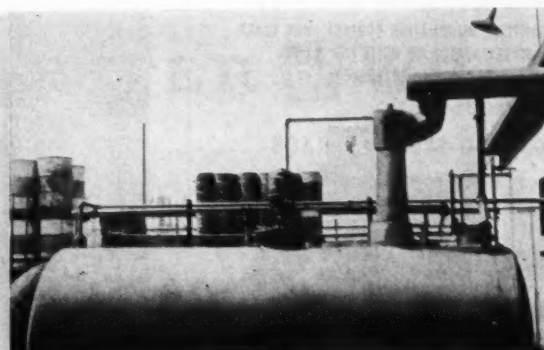


SK Fig. 4010 Fume Scrubber.



SK Fume Scrubber mounted on fuel oil tank absorbs sulfide reduction fumes.

Oleum tank in building connected by vent to SK Fume Scrubber mounted on 93% acid tank. Immersed acid pump supplies jet through small lines.



**SCHUTTE and  
KOERTING Company**

*Manufacturing Engineers*

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CORNWELLS HEIGHTS  
BUCKS COUNTY, PA.

Representatives in Principal Cities

When inquiring check CP 8492 on handy form, pgs. 2-3

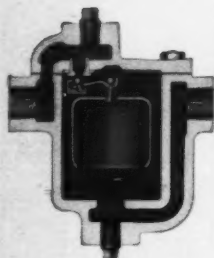


# DOUBLE DRAINAGE

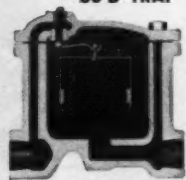
AT LOWER  
COST WITH



FAMOUS DUO-STEP LEVERAGE IS NOW AVAILABLE FOR THE FIRST TIME ON THESE SMALLER SIZED STEAM TRAPS. GET HIGHEST DRAINAGE CAPACITY AT LOWEST COST.



CLARK  
60-D TRAP



CLARK  
70-D TRAP

Duo-Step is the revolutionary double fulcrum principle that affords maximum leverage to "crack" the valve from the orifice seat, teamed with "Follow-through" power that opens the orifice completely. This double action actually gives you double the drainage capacity of ordinary steam traps.

**MODEL 60-D** traps are of cast semi-steel construction, designed for pressures up to 200 P. S. I. and temperatures to 400°F. Duo-Step levers and brackets of stainless steel construction. Seats and discs are of Clark-loy. 1/2" or 3/4" horizontal inlet and outlet connections with 1/4" test outlet and drain plug. Vertical inlet can be furnished in 1/2" or 3/4" size.

**MODEL 70-D** traps are of cast semi-steel construction, designed for pressures up to 200 P. S. I. and temperatures to 400°F. All working parts of stainless steel construction. Seats and discs are of Clark-loy. Horizontal inlet and outlet connections located at bottom of trap body for close-to-the-floor installations.

**MODEL 70-TD** for pressures to 150 P. S. I. and temperatures to 375°F. is available WITH BUILT-IN THERMAL BY-PASS at additional cost.

FOR COMPLETE INFORMATION CONTACT YOUR CLARK REPRESENTATIVE OR WRITE FOR NEW DUO-STEP BROCHURE



## Clark

MANUFACTURING COMPANY

1830 EAST 38th STREET  
CLEVELAND 14, OHIO

Distributors and Representatives in all major cities

When inquiring check CP 8493 on handy form, pgs. 2-3

## PROCESSING

### Technical data offered on process equipment

Technical data on chemical processing equipment are listed in equipment maker's catalog. Included is information on capacities, machine sizes, horsepower requirements, and design features.

Machines described are: grinding mills, abrasion resistant pumps, disc and drum filters, automatic samplers, crushers, slurry agitators, direct heat dryers, laboratory and pilot model machines, thickeners, vibrating screens, and flotation machines.

Actual process flowsheets are shown, including complete plant data. Manufacturer's materials and flowsheet testing service is described.

Catalog on chemical processing equipment is issued by Chemical Equipment Division, Denver Equipment Company, Dept. CP, P.O. Box 5268, Denver, Colorado. When inquiring specify CP 8494 on handy form which is located between pages two and three.

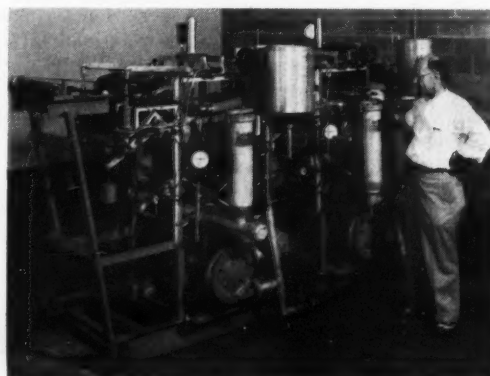
### Cotton, wool, and synthetics dyed speedily and continuously on compact machine . . .

full-scale five-unit installation requires only 500 sq ft of floor space

**Uses:** Machine is used for dyeing and wet processing of textiles.

**Features:** Many fabrics can be speedily (20 to 120 yd/min) and continuously dyed, with a low volume of dye solution. Changeovers, from one dye to another, are easily made. Machine is compact — a full-scale five-unit installation requires only 500 sq ft of floor space.

**Description:** Each unit of installation known as the Bond Machine, operates as follows. Fabrics pass through an upper and lower perforated plate. Circulating pump forces processing liquor into baffled header units which are connected to the plates. Liquor



Inventor shown with pilot plant machine, built by Hussong-Walker-Davis Company



It's a  
happy  
marriage  
for you!

The largest filtration sales organization in the United States, Bowser Inc., and Process Filters, Inc., one of the most experienced Process Filtration Organizations . . . have joined together to bring you a new concept of service and skill in the field of liquid process filtration.

Process Filters, Inc., manufactures a complete line of Vertical Leaf and Horizontal Leaf Filters that offer low cost operation, improved cake washing and recoveries, high feed rates and greater operating capacities. Filters to meet every operating condition are available . . . backed by a service-engineering organization with 70 years experience in dealing with filtration problems. In all, Process Filters, Inc. has more than 100 filtration specialists located in 40 cities who can render on-the-spot service in bringing you a prompt solution to every filtration problem.

For complete information on Process Filters, Inc. call the Bowser Sales Office nearest you . . . you'll find these offices listed below and in the classified section of your local telephone directory.

A complete folio on Process Filtration including: "What Every Engineer Should Know About Process Filtration" and profitable methods of "Filter Cake Washing" is an indispensable and valuable addition to your library and is yours by calling your local Bowser Office or mailing your request to Process Filters, Inc.

Albany	Detroit	Philadelphia
Akron, Ohio	Ft. Wayne	Pittsburgh
Atlanta	Grand Rapids	Portland, Oregon
Baltimore	Greensboro, N. C.	Salt Lake City
Birmingham	Houston	St. Louis
Boston	Honolulu	San Francisco
Buffalo	Indianapolis	Seattle
Charlotte, N. C.	Kansas City	Spokane
Chicago	Los Angeles	Syracuse
Cincinnati	Miami	Springfield, Mass.
Cleveland	Milwaukee	Tampa
Dallas	Minneapolis	Tulsa
Denver	New York	Washington, D. C.

**pf** Process Filters Inc.  
Subsidiary of Bowser, Inc.  
1809 Elmwood Ave.  
Buffalo 7, N. Y.

When inquiring check CP 8495 on handy form, pgs. 2-3

CHEMICAL PROCESSING

passes through perforations and is forced into fabric with equalized pressure on both the face and back of material. Use of liquid pressure instead of mechanical pressure is easier on delicate fabrics. Distance between pressure plates is adjustable to facilitate dyeing of high pile fabrics, such as carpeting.

Header design produces continuous sheets of solution that meet within the fabric and exclude the air as fabric passes through in open width. Dyes or chemical liquors are supplied from makeup tanks to the feed tank of machine either by gravity feed or proportioning pumps. Automatic flow controls maintain liquor level. Special dual filters keep lint and other extraneous materials from processing liquors.

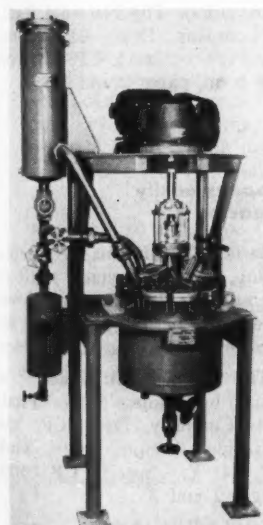
Ease of threading is made possible by automatic pressure controls for the raising and lowering of rolls and upper pressure plate. If fabric should tear or break during run, plates can be raised instantly by flicking a button. Possibility of such occurrence is minimized, however, by electronic controls which make machine practically tensionless.

Units can be used individually or in series. Average continuous installation consists of five units: dyeing, cold chemical, rinse, soaping off, final rinse.

(Further information on the Bond Machine can be obtained from the machine's sponsor: Fine Chemicals Division, Pittsburgh Coke and Chemical Company, Dept. CP, Neville Island, Pittsburgh, Pa. . . or check CP 8496 on handy form, pages 2 and 3.)

#### Lab pilot resin kettle follows ASME code

**Uses:** Lab pilot kettle is designed primarily for phenolic resins but can be used in processing other types of materials.



Lab-size kettle

#### Description:

Model C-10 kettle is stainless steel, and has anchor type agitator with variable-speed drive, condenser and receiver, and arrangement for either refluxing or withdrawing. Jacket, for pressure to 150 psi, has continuous spiral baffle. Unit is made to ASME code, inspected and stamped for internal pressures to 25 psi, or vacuum.

Production sizes up to 3000 gal capacity can be built by manufacturer.

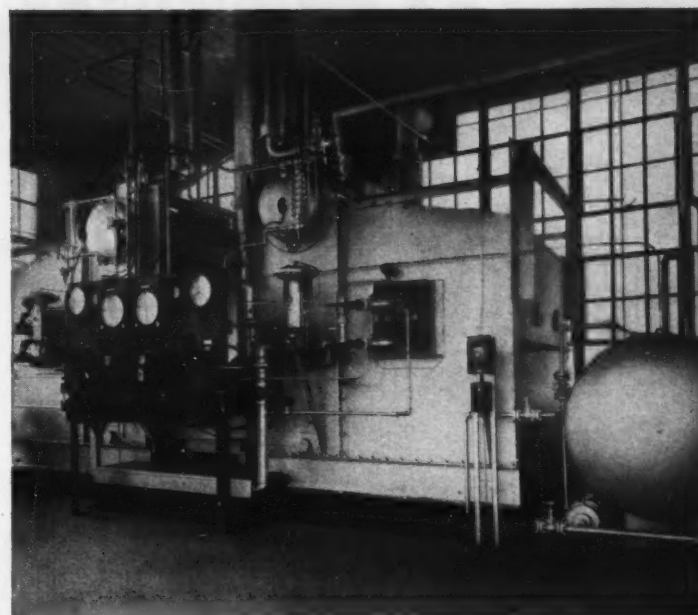
(Kettle is made by Dept. 2, Brighton Copper Works, Inc.,

Dept. CP, 820 State Street, Cincinnati 4, Ohio . . . check CP 8497 on handy form, pages 2 and 3.)

## These 9 Advantages of FOSTER WHEELER Heating Systems

Help you improve product quality, reduce operating expenses

1. High temperatures with low pressures
2. Fraction-of-a-degree temperature control
3. Uniform temperature throughout each processing step
4. High heat transfer coefficients
5. Low make-up
6. Low maintenance and repairs
7. Reduced operating hazards
8. Low time and material losses during cleaning
9. Fully automatic operation



MANY production men are familiar with these advantages of modern high-temperature heating systems. Yet only too often the considerable technical knowledge and experience needed to design and construct the specialized equipment—by which cost reductions and product improvement may be realized—are not given adequate consideration.


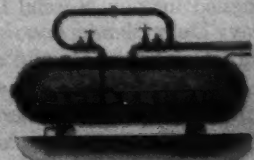
Foster Wheeler has engaged for over twenty years in the perfection of high-temperature heating systems. A specialist in the development of such systems, it built the first complete Dowtherm installation. Altogether, it has constructed over 450 units, totalling over one billion, five hundred million btu per hr. These units have ranged from the smallest (44,500 btu per hr, 700F, 88 psi), to the largest (45,000,000 btu per hr, 700F, 88 psi).

Foster Wheeler welcomes the opportunity to discuss with you the savings that such systems may make possible as a low-cost solution to your critical processing problems. For further information write to: Foster Wheeler Corp., 165 Broadway, New York 6, N. Y.

#### TYPICAL APPLICATIONS

- Molding plastic and rubber products
- Processing paints and varnishes
- Manufacturing linoleum
- Melting asphalt
- Processing food products
- Plating tin
- Melting solders and other like metals
- Heating rotating drums and coating rolls
- Drying and baking enamels
- Heating chemical process equipment
- Evaporating high-boiling materials
- Deodorizing vegetable oils
- Petroleum fractionation

## FOSTER WHEELER

MEETING THE EXACTING NEEDS OF THE PROCESS INDUSTRIES	
 <p><b>WASTE HEAT BOILERS</b> Help achieve maximum fuel economy and effective temperature control in chemical, oil, paper, metal and many other industries.</p>	 <p><b>STEAM ACCUMULATORS</b> Automatically store steam to meet peak demands of process plants. Permit operation of boilers at constant, most economical rate.</p>

When inquiring check CP 8498 on handy form, pgs. 2-3



# DAY

# means longer life span

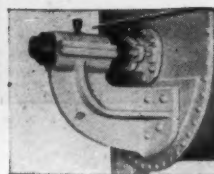


DAY large capacity heavy duty blenders  
at A. E. Staley Co., Decatur, Ill.

\*Rugged construction plus precision engineering . . . that's the DAY combination that means *extra* years of trouble-free, economical operation. Plant after plant is finding this true. Whatever your special need, you'll find a DAY Heavy Duty Blender designed for you. Special DAY features on this Heavy Duty Blender have been developed to provide top performance and extra-long equipment



DRY COLOR AGITATOR



OUTBOARD BEARINGS

life span. The DAY dry color agitator is designed for heavy bodied powders. Other types of agitators are available to meet specific requirements. DAY large outboard bearing construction gives maxi-

mum shaft support, smooth operation. Exclusive stuffing box design prevents bearing damage from abrasive materials, and eliminates danger of product contamination by bearing lubricants. The DAY spiral ribbon agitator is designed for paste, semi-paste, granular or liquid products. For complete information or service, call your nearest J. H. Day field engineer or write for Bulletin 354-A.



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FOUNDED 1887

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PRODUCERS OF QUALITY EQUIPMENT FOR BAKING • PAINT & VARNISH • CHEMICAL  
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CERAMICS • CANDY • SOAP • SUGAR • MILK PRODUCTS • OTHER MAJOR INDUSTRIES

## PROCESSING

### Nozzle clogging stopped by cooling water catch pan

*Uses:* Pans are recommended for use on top of cooling and condensing section when (1) cooling water is dirty enough to clog spray nozzles, (2) spray is ob-



Water pan distributes and  
cleans dirty cooling water

jectionable to nearby buildings, or (3) spray will corrode nearby equipment.

*Features:* Can be fitted to cooling sections without fasteners.

*Description:* Cast iron, open-top water distributing pans are designed for maximum flow of 40 gpm through bottom holes. Collected trash and mud can be quickly flushed or scooped out.

(Open-top water distributing pans are product of The National Radiator Company, Dept. CP, Johnstown, Pa. . . . check CP 8499 on handy form, pages 2 and 3.)

### Lid opens easily on reactor

Reactors having magnetic coupling, allowing agitator shaft to be split so that the hinged vat head can be swung open, are described in four-page folder.

"The Access-A-Bilt Reactor" is issued by Stainless & Steel Products Company, Dept. CP, 558 Madison Avenue, New York 22, N. Y. Specify CP 8500, pages 2 and 3.

For more information on product at left, specify CP 8501 . . . see information request blank between pages 2 - 3.

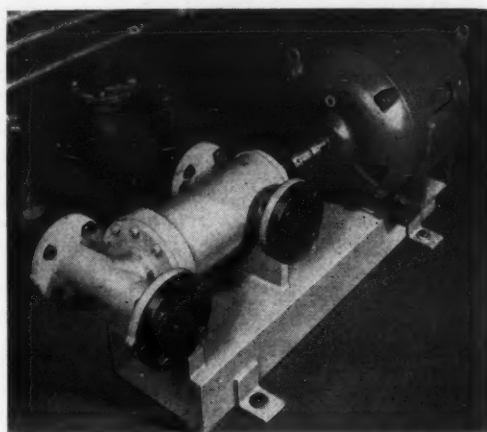
**Increase in operational performance and efficiency offered by disc disperser . . .**

no cooling apparatus required since negligible amount of heat is generated

**Uses:** Making emulsions and dispersions.

**Features:** No cooling apparatus is required with disc disperser since negligible amount of heat is generated, which indicates a substantial increase in operational performance and efficiency. Increased yields, shorter production cycles, and savings in power and steam are other advantages resulting.

**Description:** Knives in disc disperser provide positive shearing action on the material instead of usual tearing that generates frictional heat. Knives revolve at a very high rate of speed between perforated plates to reduce material to a fine consistency.



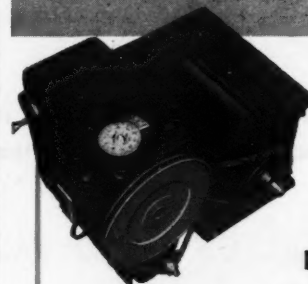
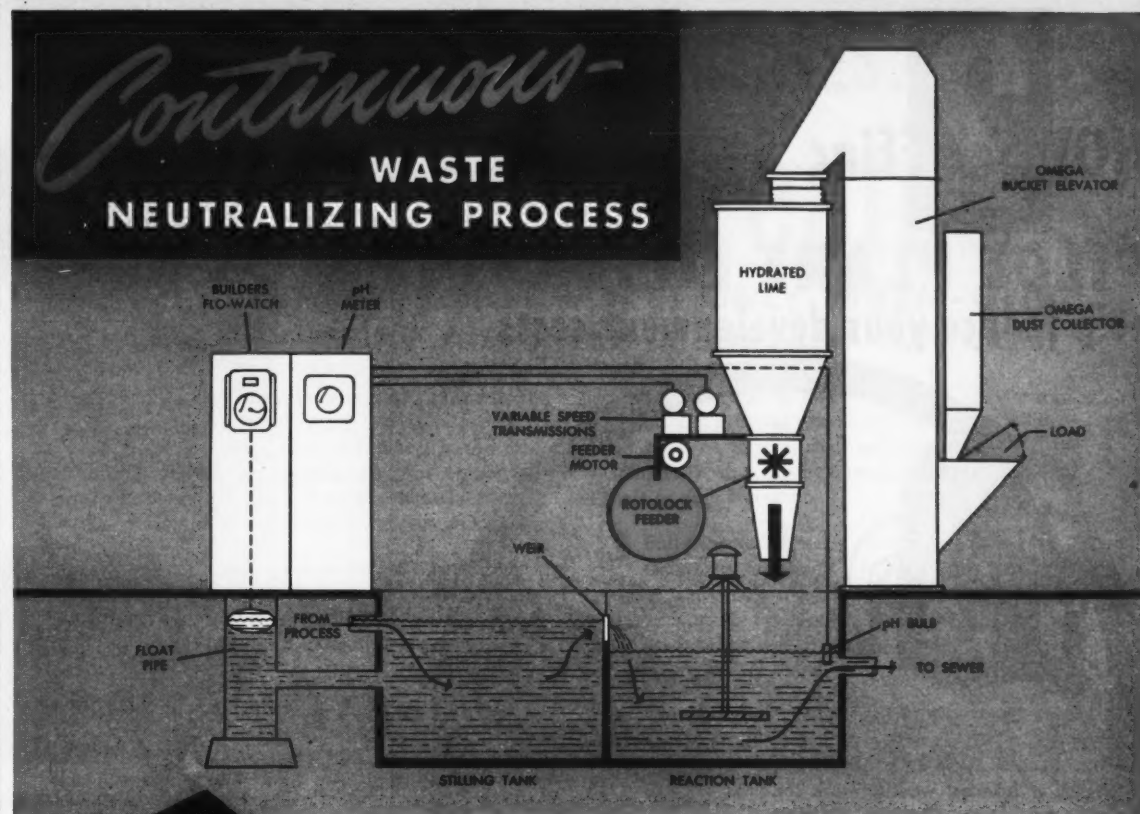
Knives in disperser provide positive shearing action on material

In the case of greases, unit cuts long fibers and stabilizes grease without over-working, which eliminates possibility of greases returning to their original state. Hard greases may be formulated with this unit which breaks up large lumps and makes it possible to screen out final, minute particles.

Disc dispersers are completely self-contained and are driven by a 15-hp, 1800-rpm motor. Overall size of compact unit is 53" long, 13" wide, and 21" high.

(Disc disperser is a product of Cazenovia Precision Machine Co., Inc., Dept. CP, 667 Oakwood Ave., East Aurora, N. Y. . . . or for more information check CP 8502 on handy form, pages 2 and 3.)

**VACUUM PUMPS and PIPES**  
can be sized quickly with two nomographs on page 196



**OMEGA  
ROTOLOCK  
DOES THE JOB**

Omega Rotolock — a rotating vane feeder — feeds hydrated lime into the reaction tank in response to the flow of acid waste (measured by a Builders Flo-Watch Instrument) and to the degree of neutralization (measured by a pH meter).

The Rotolock is a volumetric feeder of simple design and rugged construction, easily adapted to installations requiring proportional pacing by auxiliary meters. The Feeder, powered by a 1/4 HP motor, has a 100 to 1 feed range. Two models of Omega Rotolock Feeders are available, covering the complete range of feeds from 7.2 to 300 cu. ft. per hr.

Here's how Omega helped a customer's engineer solve a waste treatment problem for one of the nation's leading manufacturers of electrical and electronic equipment. This acid waste neutralizing "equipment package" comprises feeding, controlling, and metering units required for continuous, accurate operation . . . Omega bucket elevator, dust collector, storage hopper, Rotolock Feeder, and Builders Instruments and Control Panel. Performance of this "package" under actual job conditions has proven again that it pays to take advantage of Omega's engineering and manufacturing experience, when you need continuous proportioning equipment.

Hundreds of today's processing and production problems are being solved by Omega "packages" — for waste treatment, for proportioning two or more solids, for proportioning liquids and solids. Our engineers can help you —

*Send Coupon* →

**OMEGA MACHINE COMPANY**  
387 Harris Ave., Providence 1, R. I.

- ☐ Send Bulletin 45-H8 describing Omega Rotolock Volumetric Feeders.  
Our process problem involves:  
☐ Waste treatment ☐ Proportioning solids  
☐ Proportioning liquids and solids

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

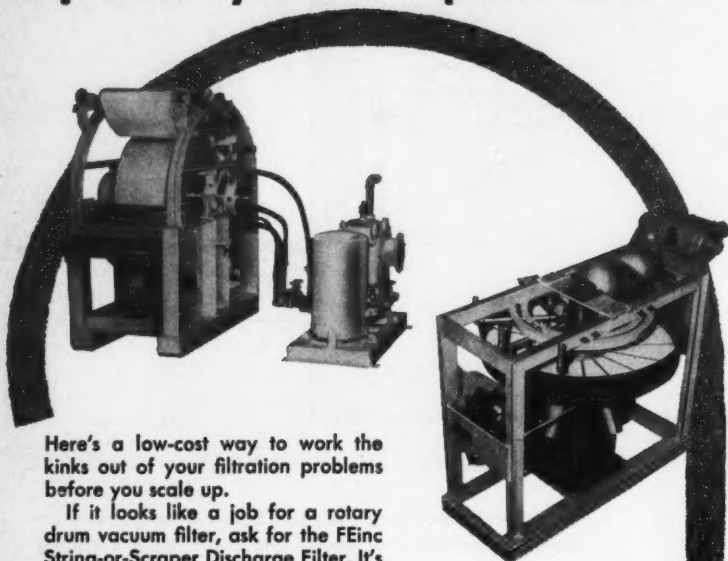
**OMEGA** THE LAST WORD IN FEEDERS  
DIVISION OF B-I-P INDUSTRIES, INC.

When inquiring check CP 8503 on handy form, pgs. 2-3



NOV **2** FEinc

## PILOT PLANT FILTERS help reduce your development costs



Here's a low-cost way to work the kinks out of your filtration problems before you scale up.

If it looks like a job for a rotary drum vacuum filter, ask for the FEinc String-or-Scraper Discharge Filter. It's furnished with both the FEinc String Discharge and the FEinc Scraper Discharge mechanisms. You can try first one, then the other. It also has the FEinc submergence washing and compression dewatering mechanisms. These can be operated separately or disconnected if desired. This all-purpose pilot plant filter is available to you on a unique rental-purchase plan, requires no capital investment. Ask for details.

If it's a relatively free-filtering job, such as a coarse crystalline or fibrous pulp, try the simpler FEinc Horizontal Filter first. Particularly good for counter-current or multiple-stage washing. Only 3 ft. dia., with amazingly high output.

Whatever your problem, if it's continuous filtration, talk to FEinc first. Our engineering service is backed by 35 years of experience, and by our well-known ability to deliver filters that are tailor-made to fit the job . . . at no more than standard costs.



Ask for  
Bulletin

### Filtration Engineers, Inc.

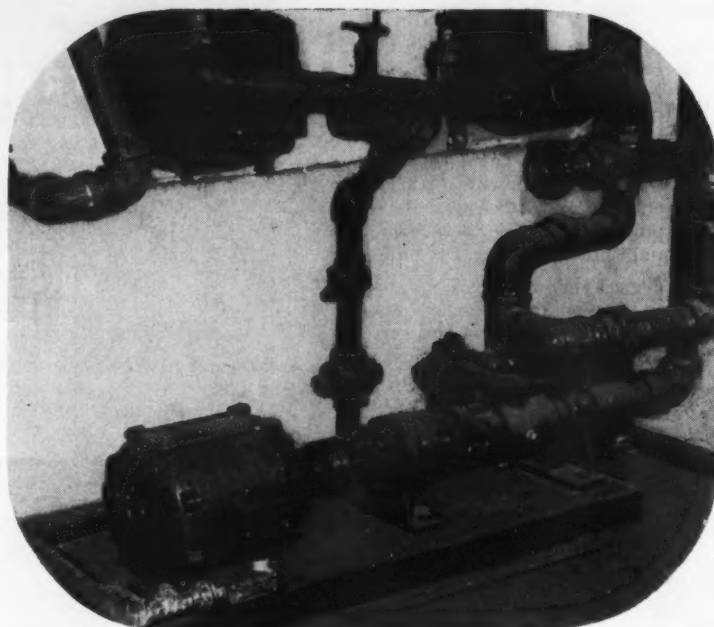
CUSTOM DESIGNERS AND MANUFACTURERS OF ALL  
TYPES OF CONTINUOUS FILTRATION EQUIPMENT

**FEinc**

44 155 ORATON STREET • NEWARK 4, N. J.

When inquiring check CP 8504 on handy form, pgs. 2-3

engineering and  
maintenance



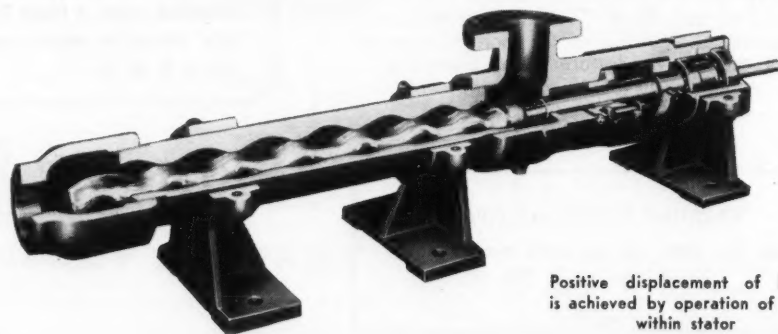
Pump performs satisfactorily even when viscous resin is below room temperature

Although told that no pump could meet requirements,  
Kyanize Paint installs unit that —

## raises high-viscosity resin 40 feet at rate of 16 gpm

Neither this pump nor second  
one, also used in continuous  
paint process, has needed any  
maintenance in more than a  
year of service

**Problem:** At Kyanize Paints Inc., in Everett, Mass., a high-viscosity resin had to be transferred from storage tank in basement to the third floor. Formerly the alkyd resin was manually carried up to the third floor in drums for addition to mixes. This procedure was time con-



Positive displacement of liquid  
is achieved by operation of rotor  
within stator

CHEMICAL PROCESSING

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suming, laborious, and not as accurate a method as was desired.

Company contacted a number of sources of supply in order to obtain a pump to handle the resin. However, it appeared that they would not be able to find a pump that could raise such a viscous material the required distance of 40 feet at a reasonable rate. It was the opinion of some that no pump then on the market could perform such an operation.

**Solution:** Approximately one year ago, Kyanize acquired a Moyno positive-displacement pump and installed it in basement for handling the resin. This unit, as shown in cutaway illustration, consists of a rotor with a shape similar to that of a cork-screw, revolving within a stator. As rotor turns, material is moved by progressive cavity action.

Company also obtained a second Moyno pump for use in the same process. Second pump transfers material from weigh tank on second floor up to mixers and also down to 1000-gal receiving tanks on first floor.

**Results:** Pump located in basement transfers the viscous resin against the 40-ft head to the third floor at a rate of 16 gpm. Pump performs satisfactorily even when resin is below room temperature. It has been a large factor in releasing one man for other duties. Accuracy has been improved and production increased with the continuous process, made possible by the pumps, along with other equipment.

Second pump has also operated satisfactorily at a slightly higher rate of 18 gpm due to the lower head. No maintenance has been necessary on either pump during the period of a little more than one year they have been in service.

(Moyno pumps are manufactured by Pump Div., Robbins & Myers, Inc., Dept. CP, 1345 Lagonda Ave., Springfield, Ohio . . . or for more information check CP 8505 on handy form which is located between pages 2 & 3.)

#### Wire for overlay applications can be used for joining brasses, tin bronzes

Recently-developed phosphor bronze (Grade A) bare coiled wire is primarily for overlay applications. However, this coiled wire, called Phos-Trode Bare, can also be used for joining brasses, tin bronzes, cast iron, etc, giving sound welds with the inert-gas process.

Wire is available in 0.045, 1/16, 5/64, and 3/32" diam sizes, layer wound on either spools or rims in 25 lb standard packages.

Wire may be used with Aircomatic, Linde Sigma, and General Electric filler-arc equipment.

(Phos-Trode Bare coiled wire is a product of Ampco Metal, Inc., Dept. CP, 1745 S. 38th St., Milwaukee 46, Wis. . . . or for more information check CP 8506 on handy form, pages 2 and 3.)

# WHEN YOU BUY SHEAVES... Get All These Features!

**ALL SHEAVES ARE NOT ALIKE. ONLY *Magic-Grip* SHEAVES COMBINE ALL THESE IMPORTANT FEATURES:**

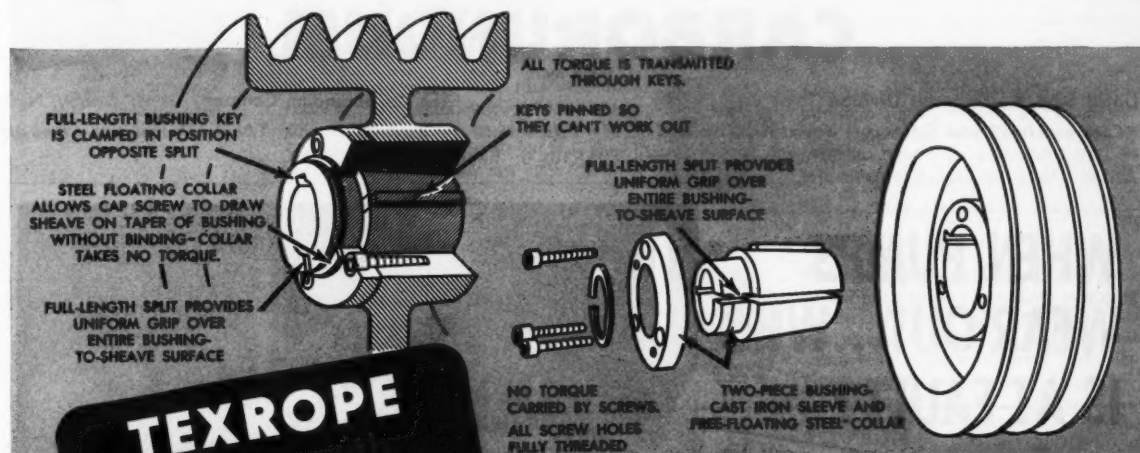
**1** Full-length contact between bushing and shaft. Bushing is slit full length instead of part way. Result — when tapered bushing is slid into tapered sheave bore, pressure is applied equally all around bushing along full length. Sheave can't get out of alignment or develop excessive runout.

**2** Full-key drive — Torque between bushing and shaft, and between bushing and sheave is transmitted by keys instead of threaded screws. Jamming of screws from shock overloads eliminated.

**3** One-piece mounting — *Magic-Grip* sheave installs as a unit instead of in two pieces. Simply slip sheave on shaft and tighten cap screws. Complete sheave can be moved back and forth on shaft to adjust position.

**4** Full-threaded screws — Cap screws in *Magic-Grip* sheaves engage a full thread — instead of a partial thread. Stripping and jamming problems eliminated!

Texrope and Magic-Grip are Allis-Chalmers trademarks.



#### Here's Comparison of *Magic-Grip* Sheave and Other Sheaves

	<i>Magic-Grip</i> Sheaves	SHEAVE A	SHEAVE B	SHEAVE C
Bushing fully split for uniform clamping action.	Yes	Yes	No	Yes
Load carried by keys instead of threaded bolts.	Yes	No	No	No
Bushings cover full range of NEMA "probable" shaft diameters.	Yes	Yes	Yes	No
All screws engage full thread.	Yes	Yes	Yes	No
Mounts in one piece.	Yes	No	Yes	Yes
Squares itself with shaft.	Yes	No	No	No

All Allis-Chalmers sheaves available with *Magic-Grip* bushing.

Get more information on the fastest mounting sheave on the market. Call your nearby A-C distributor or district office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4278

# ALLIS-CHALMERS



When inquiring check CP 8507 on handy form, pgs. 2-3



# FOR BETTER WATER FILTRATION

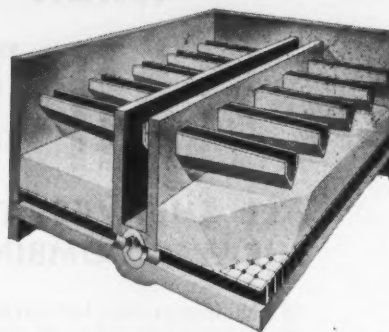
## ...ALOXITE porous underdrains

When you eliminate graded gravel and support your filter media with porous plates — specifically, ALOXITE aluminum oxide underdrains — you automatically derive these benefits:

Since the backwash discharges under the *entire* bottom surface of the filter media, cleaning can be done quicker, more thoroughly, and with less wash water. There are no mud balls, no upset beds to rebuild, and no chance of losing filter media through the underdrain.

ALOXITE bottoms also reduce the required height of the filter (by nearly the total height of the gravel). Hence, you save on new construction costs. Or, if rebuilding, the added space can be used to increase operating head, to step-up back washing, or for deepening the filter bed.

ALOXITE plates are resistant to practically all acids, and can be used safely up to 900°C. Their uniform grain structure and glass-like bond keep pressure loss to a minimum, permit maximum flow through the filter. They are easy to install, easy to operate, easy to maintain. Hundreds of ALOXITE bottoms are in service today — some in their 15th year.



Typical false bottom structure showing installation of porous underdrain plates and filter media.

**YOU'LL WANT OUR POPULAR BOOKLET.** It's the up-to-date reference source on porous media. Its 56 pages cover all fields of filtration and diffusion — including information on application, specification, designs, installation and operation. Write for free copy.



Use porous plates and tubes by

## CARBORUNDUM

Trade Mark

Dept. S-54, Refractories Division

The Carborundum Company, Perth Amboy, N. J.

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company. When inquiring check CP 8508 on handy form, pgs. 2-3

## WHEN PUMPS WEAR OUT...WHO IS AT FAULT?

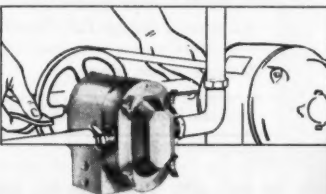
### CHECK PUMP ALIGNMENT

### Pump and Motor Misalignment Slashes Service Life

Never take motor and pump *alignment* for granted! A fraction of an inch out of true can cost you many wasted dollars — in belt replacement, bearing and impeller wear, inefficient pumping, lowered capacity.

Make *alignment check* an important part of your daily in-plant servicing on pumps — a part of your cleaning routine. It's time well spent, money saved in longer pump life, reduced pump re-

pairs . . . and keeps your product moving better, without interruption. Write for Instruction Handbook.



### Waukesha P. D.\* Sanitary Pumps Precision-Built for Long Service

You'll move many extra gallons — or pounds — with Waukesha Pumps, because they're designed to last longer in rugged daily performance. Give them the simple care they deserve — They'll reward you with years of low-cost pumping and quality protection to your products, liquid, semi-liquid, creamy or chunky.

\*P.D. — Positive Displacement — Slow Speed

**Waukesha** 100% **SANITARY PUMPS**  
Dependable Product of a Responsible Manufacturer

**WAUKESHA FOUNDRY COMPANY** 1344 LINCOLN AVENUE  
WAUKESHA, WISCONSIN

When inquiring check CP 8509 on handy form, pgs. 2-3

## ENGINEERING & MAINTENANCE

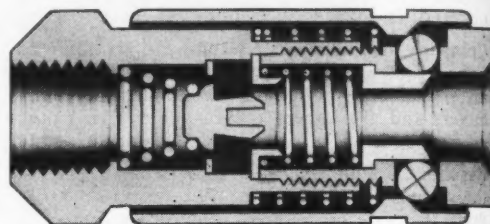
**Flow of 70 cu ft air/minute at 150 psi permitted by 4 1/2-oz coupler . . .**

air check valve shuts off flow automatically when unit is detached

**Uses:** For coupling air hose.

**Features:** Quick-detachable air coupler is said to offer 35% greater air flow, yet weighs only 4 1/2 oz.

**Description:** Large air passage in unit permits flow of 70 cu ft of free air per min @ 150 psi. Instant coupling action eliminates twisting or turning. Automatic air check valve shuts off flow of air when coupler is detached from nipple. Free swiveling of coupler on nipple prevents kinking of air hose. Coupler cannot be detached accidentally.



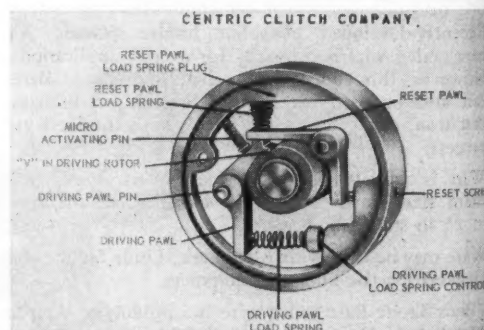
Cutaway shows interior coupler design

(Air hose coupler is a product of Lincoln Engineering Co., Dept. CP, 5701 Natural Bridge Ave., St. Louis 20, Mo. . . or for more information check CP 8510 on handy form, pages 2 and 3.)

**Eliminates motor overloads, reduces downtime in power drives . . .**

torque limiting safety clutch can be used over a wide range of speeds and shaft sizes

Designed to eliminate overloads and to reduce downtime in power drives, safety clutch is easily adaptable to specific driving arrangements such as sprockets, pulleys, belts, and gears. Can be used over a wide range of speeds and shaft sizes.



Safety clutch for speeds as low as one rpm as well as for high speeds

CHEMICAL PROCESSING

Operation  
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Operation of the clutch is as follows: (See photo) Driving pawl turns about pawl pin and is engaged with the "V" in the driving motor. Holding the driving pawl in place is the load spring, which is adjusted to the proper compression by load spring control. As soon as pre-determined overload occurs, driving pawl slides out of the notch in driving collar. Reset pawl, at this point, engages the driving pawl, maintaining clutch in released position. Clutch is then reset for operation by reset screw. The machine will then resume operation at the exact cycle point of release.

Clutch will run in either direction and is equipped with a micro-switch activating pin for use with an external micro-switch for automatic power shut-off.

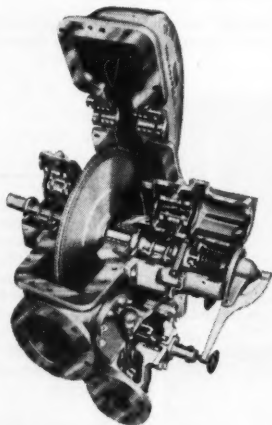
(Centric overload trig-o-matic clutch is manufactured by Centric Clutch Co., Dept. CP, Main St. at Route 35, Woodbridge, N. J. . . . or for more information check CP 8511, pages 2 and 3.)

#### Redesign of steam turbines results in added hp

**Uses:** For steam turbine applications.

**Features:** Change in steam turbine line is addition of a steam nozzle to all models. Two-nozzle DH-10 and DH-20 turbines have double maximum horsepower of former units. Models DH-30, DH-40 and DH-45 have a 50% increase in horsepower.

**Description:** Design changes have been made on all models in DH line. Addition of a hand valve increases part load performance. Larger carbon ring packing glands increase maximum back pressure from 50 to 75 lb. Model DH-10 is now equipped with water-cooled bearings and a maximum of four carbon rings instead of three.



Some models of horizontal turbines have double the maximum hp of former units

Redesigned governor valve and trip valve eliminates use of packing on valve stems for high pressure and temperature turbines.

In the DH design, high pressure steam does not come in contact with casing. All high pressure parts and joints are outside and visible to operator.

Maintenance is easy even for unskilled employees. Most turbine parts are interchangeable with other models in same line.

(Steam turbines are products of Dept. 8, Dean Hill Pump Co., Dept. CP, 4000 East 16th St., Indianapolis 7, Ind. . . . or for more information check CP 8512 on handy form, pages 2 and 3.)

## which OF THESE MATERIALS IS BEST FOR *your* CORROSION PROBLEMS?



#### • ACE HARD RUBBER LININGS

Economical, universal protection against all alkalis, metallic salts, practically all inorganic acids, hydrochloric acid any strength, sulphuric to 50%, nitric to 20%, phosphoric to 75%. Good to 160° F. — sometimes higher. Ask for details of Ace two-layer lining system.

#### • ACE SOFT RUBBER LININGS

Corrosion resistance near that of hard rubber . . . recommended where abrasion, mechanical abuse, or temperature variations are problems. At left is 12,000 gal. outdoor acid storage tank, lined with soft rubber.

#### • ACE SYNTHETIC RUBBER LININGS

Many types available for handling oils, gasoline, other organic corrosives. Often used for higher heat resistance. Evaporator head at left, for instance, works at 212° F.

#### • ACE MOLDED HARD RUBBER PARTS

Many parts can be produced most economically by molding. This chlorine gas cell cover is example. Many large shapes can also be fabricated by special hand-wrapping process.



#### • ACE HARD RUBBER PIPE AND FITTINGS

Two types: (1) All hard rubber, threaded pipe for service to 50 psi., 120° F. (2) Rubber-lined steel, flanged pipe for pressures to 125 or 250 psi. Have same fine chemical resistance as tank linings.



#### • ACE SARAN

Saran pipe, tubing, fittings, diaphragm valves, special molded parts, etc., have unusual resistance to chemical attack at room temperature. Dimensionally stable. High strength.



#### • ACE PARIAN

Slightly better resistance at room temperature to moisture and chemicals (except acetic acid) than Saran. High impact strength. Odorless, tasteless, non-toxic, good for handling foods. At left: Parian diaphragm valve.



#### • ACE-HIDE

New resin-rubber blend combines unusually high impact strength and toughness with light weight and good chemical resistance. Available in molded parts. At left is standard 3-gal. Ace-Hide acid pail.



#### • ACE-TEX

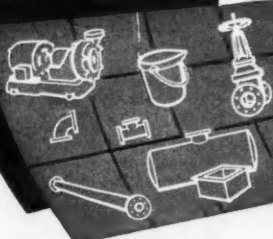
Low cost pyrobituminous molding compound has excellent resistance to strong alkalis, calcium chloride, hypo, sulphuric acid to 1.30, etc., but poor resistance to organic solvents and oils. Good for small tanks, etc.



#### • TEMPRON

New heat-resistant Buna-N compound handles many corrosives to 200° F. and above. At room temperature has better resistance to organic chemicals than natural rubber or plastics. Pipe, fittings, fabricated parts, etc.

more RESISTANT  
TO more CHEMICALS



With literally hundreds of rubber and plastic compounds to choose from, we can usually supply the one best, most economical material for any corrosion problem. Pumps, tanks, piping, valves, utensils, and special molded or fabricated parts. Ask for our recommendations.

## ACE® rubber and plastic products

AMERICAN HARD RUBBER COMPANY  
93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 8513 on handy form, pgs. 2-3



What every reader of . . .

## CHEMICAL PROCESSING

should know!

*It's a Snap*

*to Apply*

**BALDWIN-HILL**

**MONO-KOVER**

**ONE-PIECE PIPE INSULATION**

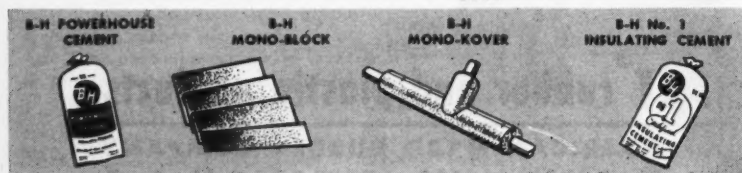
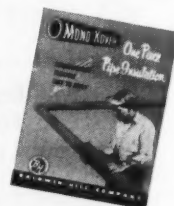


- Extra Light Density
- Easily Cut and Fitted
- Six Foot Lengths
- Resilient, Flexible
- Won't Break or Crumble
- Easy to Paint
- Highly Efficient
- No Coarse Fibers
- Takes Rough Handling
- Easily Nested
- Non-Corrosive
- Won't Rot, Decay, Mold
- Lower Applied Cost
- Factory Applied Vapor Barrier

## Baldwin-Hill COMPANY

405 BREUNIG AVE., TRENTON, N. J.  
Kalamazoo, Mich. • Huntington, Ind. • Temple, Tex.

Send for bulletin with data on how to apply, properties, selection help, sizes and thicknesses available



When inquiring check CP 8514 on handy form, pgs. 2-3

## MAINTENANCE

Fractional hp motors feature smaller size, lighter weight

Two special-service, fractional hp motors, for applications requiring moderately high starting torque, have been announced by company.

Rated at  $\frac{1}{2}$  and  $\frac{3}{4}$  hp, 1725 rpm, the motors can be mounted in any position, and are easily reconnectable at terminal board for 115 or



Rated at  $\frac{1}{2}$  &  $\frac{3}{4}$  hp, 1725 rpm

230 v. They are said to be smaller and lighter in weight than corresponding general-purpose ratings.

With starting currents that conform to NEMA standards, motors can be used in evaporative coolers, fans, compressors, and workshops.

(Products of General Electric Co., Dept. CP One River Rd., Schenectady 5, N. Y. . . . or for more information check CP 8515 on handy form which is located between pages two and three.)

### Covers centrifugally cast stock, pipe, tube

Products and applications of centrifugally cast heavy-wall cylindrical stock, tube, and IPS pipe are described in 10-page booklet. Text discusses manufacturing of products and their resistance to heat, abrasion, and corrosion. Illustrations supplement text.

Booklet 184-A is available from Electric Steel Foundry Co., Dept. CP, 2141 N.W. 25th Ave., Portland 10, Ore. When inquiring specify CP 8516 on handy form located between pages two and three.

## GET *More* WITH *Less* with ABBÉ TURBO SIFTERS

Four of 8 mechanically fed, continuous Abbé Sifters for tartaric acid and cream of tartar, which replaced bolting reels and increased production in less floor space.

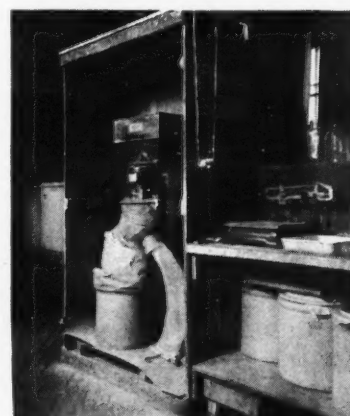


Abbé Turbo Sifters increase production of sifted materials with much less floor space. They will give you:

- **Faster Sifting.** Two to ten times faster, depending on the materials handled.
- **Much Less Floor Space.** Savings up to 75% over conventional sifting equipment.
- **No Segregation.** Centrifugal sifting prevents the segregation often resulting with ordinary sifters.
- **Far Better Dispersion.** Particularly with mixes involving colors.
- **Cleaner, More Thorough Separation** on any materials and for any mesh.

### Centrifugal Force Instead of Gravity

The sound application of centrifugal force to the sifting operation provides these improvements over conventional methods depending on gravity.



Abbé Turbo Midget Sifter producing 100 lbs. per hour of tungsten oxide, using alloy metal screens to withstand corrosive material. Quick sifting on an intermittent basis has improved production.

WRITE FOR BULLETIN 65

## ABBÉ ENGINEERING COMPANY

50 Church Street • New York 7, N. Y.  
Address Department 46

When inquiring check CP 8517 on handy form, pgs. 2-3

CHEMICAL PROCESSING

### Weight and cost savings result from sprayed-on fireproofing . . .

plastering machine speeds job in industrial construction and broadens applications

**Uses:** For the application of fireproofing plaster.

**Features:** Plastering machine is said to speed job of plaster fireproofing in industrial construction, and broaden application by enabling plaster to be used in many areas. Compared to poured concrete fireproofing, vermiculite fireproofing applied by this method is said to make possible weight savings up to 90%, with cost savings as well.

**Description:** E-Z-On Machine consists of a hopper, a 3-hp single phase 220v motor, and an air compressor mounted on three roller bearing wheels with solid rubber tires. Dimensions of unit are 60" long x 42" high x 26" wide. Weight is 620 lb.

Plaster, made with a lightweight aggregate (most common one used is vermiculite) is mixed in any kind of power-driven mixer and placed in hopper of machine. Plaster is pumped through a rubber hose to a spray nozzle. Maximum capacity is 66 cu ft plaster/hr.

A non-kinking rubber-covered hose two inches in diameter is used to apply the plaster. Pressure in this hose varies from 100 psi at machine end to 50 psi at nozzle end. Depending on thickness of plaster used, hose length may vary from 25 to 80 ft. Air is delivered through 5/16" diameter hose at 8 to 15 pounds per sq inch.

Pumping rate, air pressure, and spray pattern are individually adjustable. A variable pitch motor pulley can be adjusted for a maximum pumping speed of one cu ft of plaster per min. A bleed-off valve near air pressure gage may be turned to raise or lower pressure as desired. Spray pattern at spray nozzle is varied by changing distance between air stem and nozzle tip.

Sand plaster cannot be applied by machine because sand separates from gypsum in hose. Sand also causes serious abrasion of plaster hose. All tests indicate that lightweight plasters applied by machine compare favorably in strength with a sanded plaster.

(Plastering machine is a product of Zonolite Company, Dept. CP, 135 South LaSalle St., Chicago 3, Ill. . . . or for more information check CP 8518 on handy form, pages 2 and 3.)

On the lookout for plant engineering equipment and supplies? . . .

Your task will be easier if you consult the alphabetical Product Directory, pages 213 to 216, for pumps, valves, electrical items, motors, etc. This is another Putman-style service provided in every issue.

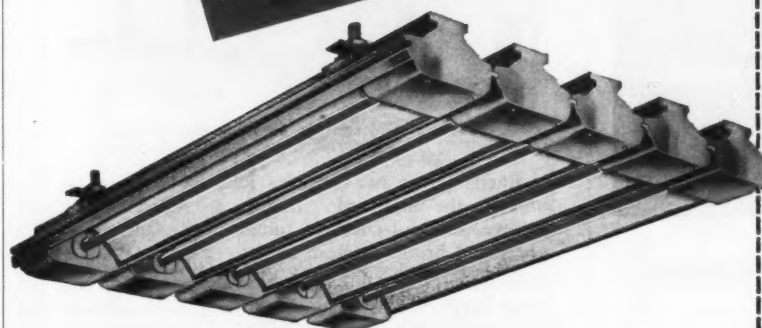
## CHROMALOX gives you the LOW COST answer

for

variable heat

non-breakable infrared

safe operation



## CHROMALOX all-metal electric radiant heaters

Get all the advantages of infrared heat and more—at a fraction of former costs with the new and improved CHROMALOX heating principle. All-metal construction, high heat intensity, infrared radiation that's "color blind" and heat that's infinitely variable, have proved CHROMALOX Radiant Heaters superior for over 300 different uses in more than 1500 plants. If you use heat for baking, drying, preheating, curing, degreasing and similar applications, CHROMALOX Radiant Heaters can very likely give more satisfactory results. See for yourself how these infrared units up output, improve uniformity, reduce costs.

### CHROMALOX

*Electric Heat for Modern Industry*

## Time, money and material saving applications

FOR MORE INFORMATION  
CHECK, CLIP AND MAIL COUPON

### PLASTICS

- ☐ Drying powders
- ☐ Drying Cellophane
- ☐ Preheating strips
- ☐ Preheating cloth
- ☐ Curing vinyl
- ☐ Post-forming
- ☐ Curing tubing

### FOOD

- ☐ Warming
- ☐ Drying baking pans
- ☐ Dehydrating crackers
- ☐ Baking biscuits
- ☐ Dehydrating coconuts

### TEXTILES

- ☐ Dehydrating braided material
- ☐ Drying Nylon thread
- ☐ Dehydrating woolen cloth
- ☐ Setting flock

### RUBBER

- ☐ Curing
- ☐ Heating rubber glue
- ☐ Curing latex

### METALS

- ☐ Heating molds
- ☐ Degreasing
- ☐ Paint baking
- ☐ Drying piston rings
- ☐ Baking wrinkle paint
- ☐ Welding preheating
- ☐ Drying automotive parts
- ☐ Preheating steel rolls
- ☐ Dehydrating refrigeration coils

### GLASS

- ☐ Drying bottles
- ☐ Heating safety glass
- ☐ Setting dye on glass cloth
- ☐ Preheating lenser
- ☐ Drying mirrors

### PRINTING

- ☐ Ink drying
- ☐ Static elimination
- ☐ Glue drying
- ☐ Drying varnished paper
- ☐ Silk screen drying

### ELECTRICAL

- ☐ Baking armatures
- ☐ Drying marine equipment
- ☐ Sealing headlights and television tubes
- ☐ Drying varnished wire
- ☐ Drying carbon resistors
- ☐ Drying color coding

### CERAMICS

- ☐ Drying frit
- ☐ Drying glaze
- ☐ Drying pottery

### FOUNDRIES

- ☐ Drying sand cores
- ☐ Skin drying of molds
- ☐ Comfort heating

### MISCELLANEOUS

- ☐ Sealing storage batteries
- ☐ Setting adhesives and cements
- ☐ Curing tobacco
- ☐ Melting wax
- ☐ Drying photographic negatives and prints
- ☐ Dehydrating kraft paper

and many other Applications

EDWIN L. WIEGAND CO., Radiant Heater Division  
7517 Thomas Blvd. Pittsburgh 8, Pa.

I am interested in Infrared heat for \_\_\_\_\_

- ☐ Send me application file on uses I have listed.
- ☐ Ask factory representative to contact me.
- ☐ Send Chromalox Catalog on Industrial Heaters.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

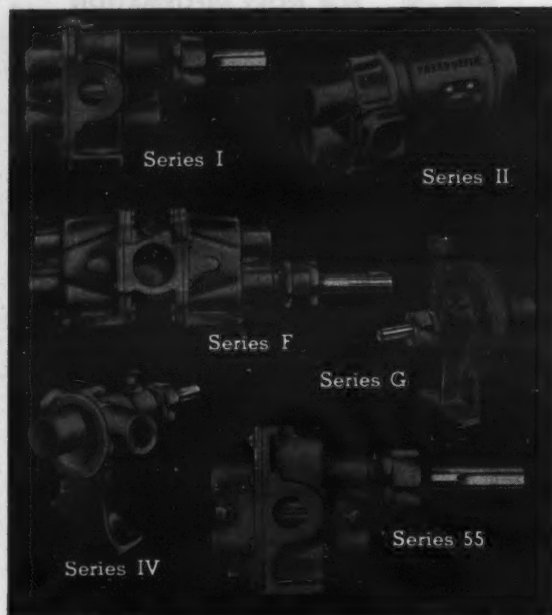
City \_\_\_\_\_ Zone \_\_\_\_\_

State \_\_\_\_\_

When inquiring check CP 8519 on handy form, pgs. 2-3



**You bought 40% more of them  
in the 1st quarter of 1954 than  
in the 1st quarter of 1953**



**Series I—Heavy duty bronze rotary gear pumps**  
Oilless bearings 2-23 G.P.M.—0-100 P.S.I.

**Series II—Close coupled motor driven bronze pumps**  
Oilless bearings 2-4 G.P.M.—0-100 P.S.I.

**Series F—High volume bronze rotary gear pumps**  
Oilless bearings 50-150 G.P.M.—0-150 P.S.I.

**Series IV—Rubber impeller bronze pumps**  
Oilless bearings 6-21 G.P.M.—0-30 P.S.I.

**Series 55—Standard bronze rotary gear pumps**  
Grease fittings 2-23 G.P.M.—0-100 P.S.I.

**Series G—Standard bronze centrifugal pumps**  
Grease fittings 2-25 G.P.M.—2-10 P.S.I.

## OBERDORFER BRONZE PUMPS

Industrial Pump Div., Oberdorfer Foundries, Inc.  
645 Thompson Rd., Syracuse, N. Y.

Address the 1954 edition of the Oberdorfer Industrial  
Pump catalog to:

NAME .....  
COMPANY .....  
ADDRESS .....

Do you want a factory representative to call ☐ Yes ☐ No

When inquiring check CP 8520 on handy form, pgs. 2-3

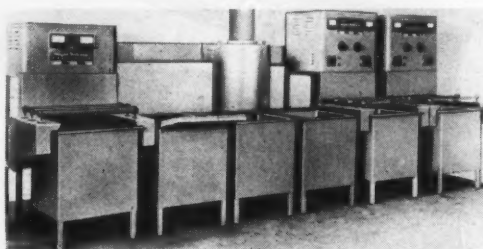
## ENGINEERING & MAINTENANCE

**On-the-spot industrial chrome  
plating accomplished  
by package unit . . .**

complete plating facilities use Morey Process

**Uses:** For on-the-spot chrome finishing of production tools and parts.

**Features:** Hard (industrial) chrome plating unit uses Morey Process. Equipment has an automatic heat control and timing system which is said to assure precision of plate deposition and make grinding and lapping to size unnecessary. Individually-controlled



Chrome plating unit has all equipment needed

rectifiers permit two separate jobs to be plated at once, in the same tank. Built-in air purifying unit removes harmful chemical fumes from plant atmosphere and brings in clean air.

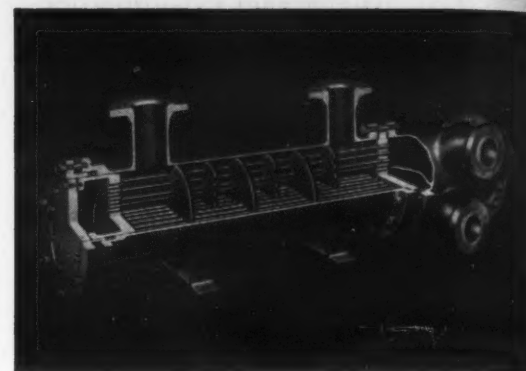
**Description:** All equipment needed for a complete hard chrome plate department is furnished: six tanks, lead and Neoprene tank linings, five rectifiers, a fume separation system, heat and timing controls, and electrical connections ready for installation. An intensive course of instruction in advanced phases of precision plating is offered as part of the process. (Plating unit is a product of Wagner Brothers, Inc., Dept. CP, 520 Midland Ave., Detroit 3, Mich. . . . or for more information check CP 8521 on handy form, pages 2 and 3.)

**Prevents flushing of free-flowing  
materials through stuffing  
glands, dust seals . . .**

rotary airlock feeder handles finely ground or granular abrasive substances

Production of a heavy-duty rotary airlock feeder has recently been announced. It has a 12" diameter inlet and discharge, and was developed for handling finely ground or granular abrasive substances such as pulverized phosphate rock, fly ash, cement, clay, silica, alumina, and sewage sludge.

PAV-12 is designed to prevent flushing of free-flowing materials through stuffing glands and dust seals. It is suited for removing such products from rotary dryers, coolers, dust collectors, electrical precipitators, bins, hoppers, and other process vessels, operating at atmospheric or higher pressures. Elevated temperatures can also be handled with this equipment.



## Griscom-Russell Uses ELECTRUNITE HEAT EXCHANGER TUBES

You'll find ELECTRUNITE Pressure Tubes in Bare-tube Heat Exchangers like the one shown above. And you'll find the heat exchangers on the job in all of the process industries.



One reason is Republic quality. The steel quality is controlled from ore to finished product. Before it's shipped, every length of ELECTRUNITE Tubing must pass rigid tests and conform to or surpass all code requirements. It is made to A.S.T.M. Specification A-214, or to customer specifications.

Republic customers have benefited from this quality control for more than twenty-five years in all kinds of processing equipment. Whether you're interested in new heat exchangers and condensers, or retubing, get the facts by writing for Booklet HEC-1. It's free.

### REPUBLIC STEEL CORPORATION

*Steel and Tubes Division*

206 East 131st Street, Cleveland 8, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, N. Y.



**ELECTRUNITE — The Original Electric Welded Boiler Tube**

When inquiring check CP 8552 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Incorpo  
convey  
feeder  
into or  
well un  
to any  
availab  
(Rotar  
Prater  
Chicago

Three  
adapt  
taper

Three  
with D  
by mar  
fasteni  
fit. • S  
C-226

(Coupl  
pling  
fill. .  
handy

MAY, 1



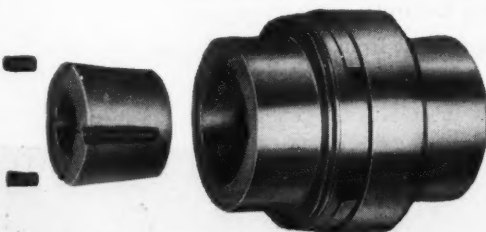
Feeder is adaptable to any pneumatic system

Incorporating a closed pocket rotor in pneumatic conveying systems, 12" feeder performs both as a feeder and an airlock to prevent air or gas leakage into or out of system. It is said to operate equally well under pressure or suction and is easily adaptable to any ordinary pneumatic system in use. Unit is available with or without packaged power.

(Rotary airlock feeder is a product of Dept. D, Prater Pulverizer Co., Dept. CP, 1515 S. 55th Ct., Chicago 50, Ill. . . . check CP 8523, pages 2 and 3.)

### Three sizes of couplings adapted for use with taper-lock bushings

Three sizes of Type C couplings adapted for use with Dodge taper-lock bushings have been announced by manufacturer. Couplings are said to permit easy fastening to shafting with firmness of a shrunk-on fit. Sizes available are: C-191 for bores  $\frac{1}{2}$  to 2"; C-226 and C-276 for  $\frac{1}{2}$  to 2 $\frac{1}{2}$ " bores.

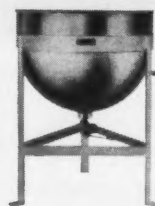
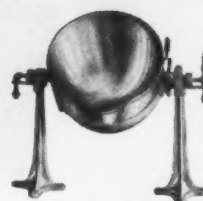
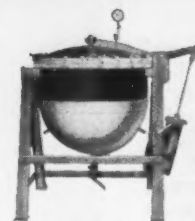


Coupling gives firmness of a shrunk-on fit

(Couplings are a product of Lovejoy Flexible Coupling Co., Dept. CP, 4872 W. Lake St., Chicago 44, Ill. . . . or for more information check CP 8524 on handy form, pages 2 and 3.)

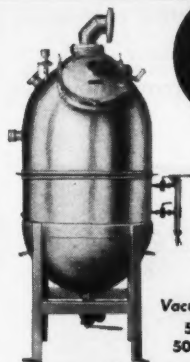
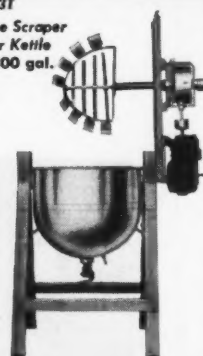
## HEADQUARTERS FOR PRODUCTIVE PROCESSING EQUIPMENT SINCE 1928

### COOKING KETTLES

Style A  
Two-thirds Jacketed  
5 to 500 gal.Style B  
Full Jacketed  
10 to 300 gal.Style C  
Two-thirds Jacketed  
5 to 100 gal.Pressure  
Kettle  
Two-thirds  
Jacketed  
40 to 200 gal.Style CW  
Two-thirds Jacketed  
80 to 300 gal.

## WIDE RANGE OF SIZES TO MEET YOUR NEEDS

### MIXING AND BLENDING UNITS

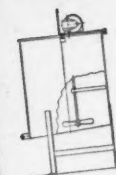
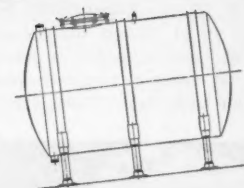
Vacuum Pan  
50 to  
500 gal.Quick Cooling Pan  
50 to 200 gal.A3T  
Center-line Scraper  
Agitator Kettle  
25 to 300 gal.CW3T  
Center-line Scraper  
Agitator Kettle  
80 to 300 gal.

## ALL UNITS BUILT FROM TIME-PROVED STAINLESS STEEL

# LEE

CORROSION-RESISTANT  
**PROCESSING EQUIPMENT**

### MIXING, COOKING & STORAGE TANKS

Pulp Tank  
500 to 2,000 gal.  
Mixing Tank  
25 to 500 gal.Storage Tank  
100 to 5,000 gal.

## Precision-built to your specific requirements!

LEE corrosion-resistant equipment is individually-designed for a specific processing operation and precision-built to give long years of peak performance with a minimum of maintenance.

Descriptive technical bulletins are available. Write for them and find out how Lee can be of real help in solving your processing problems.

**LEE** METAL PRODUCTS CO., INC.  
418 Pine Street  
Phillipsburg, Pa.

ALL LEE KETTLES ARE MADE TO A.S.M.E. CODE

When inquiring check CP 8525 on handy form, pgs. 2-3



## MAINTENANCE

### Properties of Teflon finishes detailed

Teflon finishes having unusual anti-sticking properties, high heat stability, low coefficient of friction, and excellent corrosion resistance against many chemical exposures are described in 12-page bulletin. Primers for steel and aluminum are discussed along with five enamels and one clear finish. Recommended systems for protecting metals, methods of application, precautions, and handling are covered.

Bulletin No. 1 is available from Finishes Div., E. I. Du Pont de Nemours & Co. Inc., Dept. CP, Room 7010, Du Pont Bldg., Wilmington 98, Del. When inquiring specify CP 8526, pages 2 and 3.

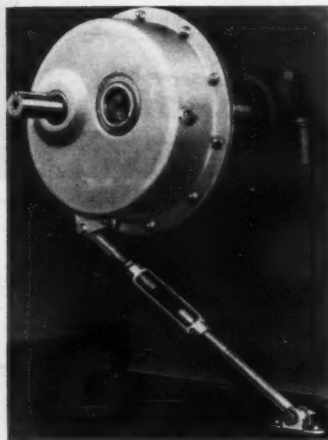
### No floor space taken by shaft-mounted speed reducer . . .

six sizes cover range from  $\frac{1}{2}$  to 30 hp

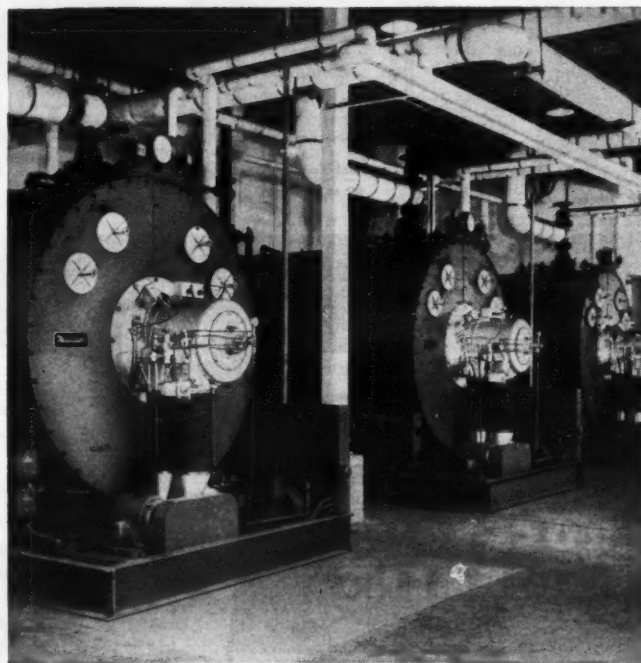
**Uses:** Speed reducer applications.

**Features:** Unit mounts directly on shaft to be driven and requires no floor space other than that needed for motor and tie rod connection.

**Description:** Drive is easily ters. It offers comparatively high adapted to fit various shaft diameters of speed reduction in limited space. A choice of single or double reduction unit makes possible selec-



Speed reducer can be adapted to various shaft diameters



Send for bulletins describing Model 3 and Model 4 Powermaster units.



# New..

# Powermaster®

# exclusive . . . . .

Now . . . for the *first time* you can get packaged boiler units in the wide range of capacities from 15 to 500 HP, with *complete interchangeability of fuels* . . . light or heavy fuel oil—natural or manufactured gas—or combination gas and oil . . . and you get this cost-saving advantage *only* with *Powermaster Packaged Automatic Boilers*. Find out more about this

new, wide-range service today from your *Powermaster* representative. He will help you with recommendations and suggestions for selecting the most economical units to supply steam or hot water requirements in any kind of service—industrial plants, institutions, public buildings, schools, laundries, apartment houses, hospitals, dairies, motels, and shopping centers.

**Model 3 Powermaster**—Experienced-proved to be the standard of industry. These three 350 HP units are supplying process steam at pressures up to 200 psi. with rapid response to load changes.

- Complete Fuel Flexibility:  
Light or Heavy Oil, Any Gas or Combination Oil and Gas.
- Choice of:  
Air Atomizing VORIFLOW Oil Burner  
—Pre-Mix VORIFLOW Gas Burner—  
Combination VORIFLOW Oil and Gas Burner—All Designed and Built by O & S.
- Full-Range Modulation with VORIFLOW Combustion.
- All Middle-Range and Large Capacities.
- Selection of Automatic Operating and Safety Controls.
- Instant Change from Fuel to Fuel.

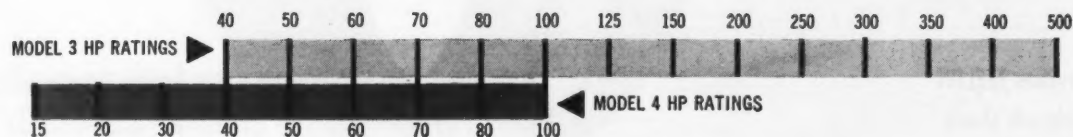
**ORR & SEMBOWER, INC.**  
**READING, PA.**  
**BUILDING DEPENDABLE BOILERS SINCE 1885**

... a choice of

2

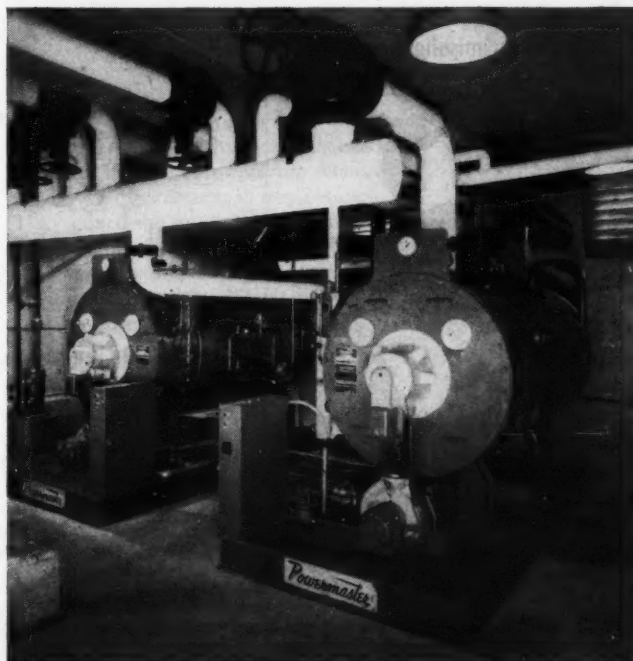
Powermaster Packaged Automatic Boilers to meet your specific operating requirements... to your best advantage.

for 15 to 250 psi. steam or hot water

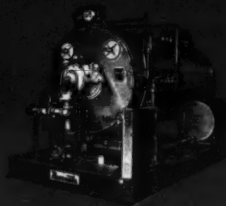


**Model 4 Powermaster**—Service-proved in wide variety of successful applications. These 40 HP units supply 15 psi. steam for heating. Simplicity of operation and controls is an important advantage.

- Choice of Fuels:  
Light Distillate—Natural Gas—Manufactured Gas—Combination Oil and Gas.
- Choice of:  
Mechanical Pressure Atomizing Oil Burner—Pre-Mix Gas Burner—Combination Oil and Gas Burner—All Designed and Built by O & S.
- Simple On-Off and Low-Fire Start Burners.
- Small and Popular Middle-Range Capacities.
- Selection of Automatic Operating and Safety Controls.
- Quick Change from Fuel to Fuel.



**Powermaster**  
PACKAGED AUTOMATIC BOILERS



## MAINTENANCE

tion of almost any output speed between 420 and 14 rpm, merely by changing sheave sizes within allowable limits. Six sizes are available to cover range from 1/2 to 30 hp. All-steel construction, efficient helical gearing, and positive lubrication are reported for unit.

(Speed reducer is a product of The Falk Corporation, Dept. CP, 3001 W. Canal St., Milwaukee 8, Wisc. . . or for more information check CP 8527, pages 2 and 3.)

### Provides semi-automatic reconditioning of dust collector plates . . .

washes, recoats plates with dust-holding adhesive

**Uses:** For use on manufacturer's Electro-Cell electronic precipitator.

**Features:** Precipitator has been redesigned to provide semi-automatic reconditioning of collector plates. Recently developed washer unit washes collector plates with water sprays and recoats them with dust-holding adhesive. Entire operation is automatic.

**Description:** Washer consists of a vertical header attached to a carriage that travels on an overhead trackway extending full width of electronic precipitator. Header is comprised of separate water and oil lines with uniformly spaced nozzles. Assembly moves across precipitator twice on washing cycle and, after a five minute drying period, sprays collector plates with adhesive.

Flat spray nozzles are placed at a 5° angle to vertical plane of collector plates, thus insuring thorough penetration of plate assembly. Type H washer is optional equipment available for all sizes larger than 6' high x 6' wide.

(Electro-Cell precipitator with Type H Washer is a product of American Air Filter Co. Inc., Dept. CP, 215 Central Ave., Louisville 8, Ky. . . or for more information check CP 8528 on handy form, pages 2 and 3.)

For more information on product at left, specify CP 8529 . . . see information request blank between pages 2 - 3.

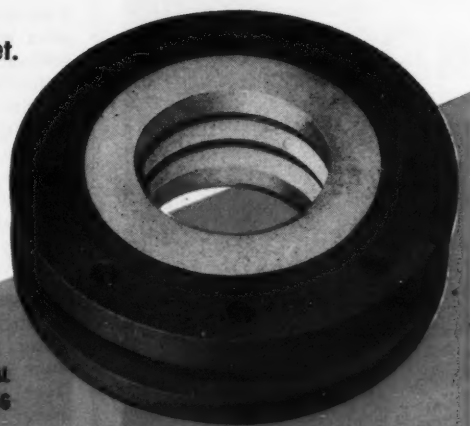




Chemically Impervious TEFLON  
Bellows absorb shock,  
vibration, expansion  
and contraction—  
correct misalignment.

Integral TEFLON Gasket.  
Flanges to match  
like or unlike  
companions at each  
point of use.

● Ask for Bulletin  
No. FC-952.



CHEMISEAL  
FLEXIBLE COUPLING

UNITED  
STATES  
GASKET  
COMPANY

CAMDEN 1 • NEW JERSEY  
FABRICATORS OF duPont TEFLON,  
Kellogg KEL-F AND OTHER PLASTICS  
Representatives in Principal  
Cities Throughout the World

When inquiring check CP 8530 on handy form, pgs. 2-3



engineering and  
maintenance

Gear mechanism, shown on  
12" butterfly valve, can  
be readily installed on  
valves in use

by use of gear mechanism —

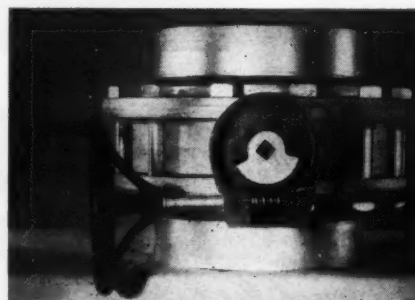
## *ease of operation achieved for butterfly valve*

Gear ratio of 30 to 1 facilitates  
opening and closing unit

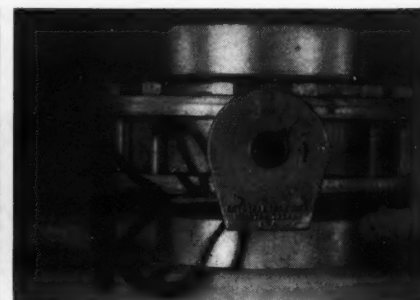
Addition of gear mechanism to manufac-  
turer's butterfly valve makes it consider-  
ably easier to operate. This feature has  
been found to be particularly useful to  
those chemical and petroleum companies

that already have the recently introduced  
gear-operated valve in service. Ease of  
operation, compared to standard valve  
with straight handle, is made possible by  
the high gear ratio of 30 to 1.

Gear mechanism can be installed on stand-  
ard lever operated handle valves in the  
field, if desired. All that is necessary is  
to drill three holes in top of valve plate



Top view of worm and pinion gears inside  
box reveals simplicity of design



Indicator points to either open, 1/4, 1/2, 3/4, or  
fully closed position

on which gear mechanism rests. Because of projection on top of box, it is impossible to install box incorrectly.

Although gear mechanism can be manufactured of any available metal, standard unit has bronze body, plate, pinion gear, indicator, and hand-wheel, while stem and worm gear are of alloy steel. Valves are available in sizes from 2 through 12 inches.

(Gear-operated butterfly valve is manufactured by Keystone Tool Corp., Dept. CP, 5325 Kirby Dr., Houston 5, Tex. . . . or for more information concerning manufacturer's product, reader may simply check CP 8531 on handy form which is located between pages 2 and 3.)

## Readily-controlled process for bronze-alloy plating announced . . .

**three compositions of deposit recommended for different purposes**

Development of a readily-controlled process for bronze-alloy plating has been announced. Laboratory studies, backed up by plant operations, are said to have demonstrated several engineering and decorative applications for the process.

In one application, hydraulic pumps are now produced by applying adherent bronze electroplates to bearing surfaces. In other applications, bronze plate produced by process has been shown to be an excellent material for facing valve seats. Process also provides a fast and easy method for depositing bronze-alloy plate for use as a stop-off against penetration of nitrogen gas in nitriding process for surface hardening.

Bronze-alloy deposit produced by process is said to be nearly three times as hard as copper plate; yet it is deposited in a ductile condition. Its structure is uniformly fine grained.

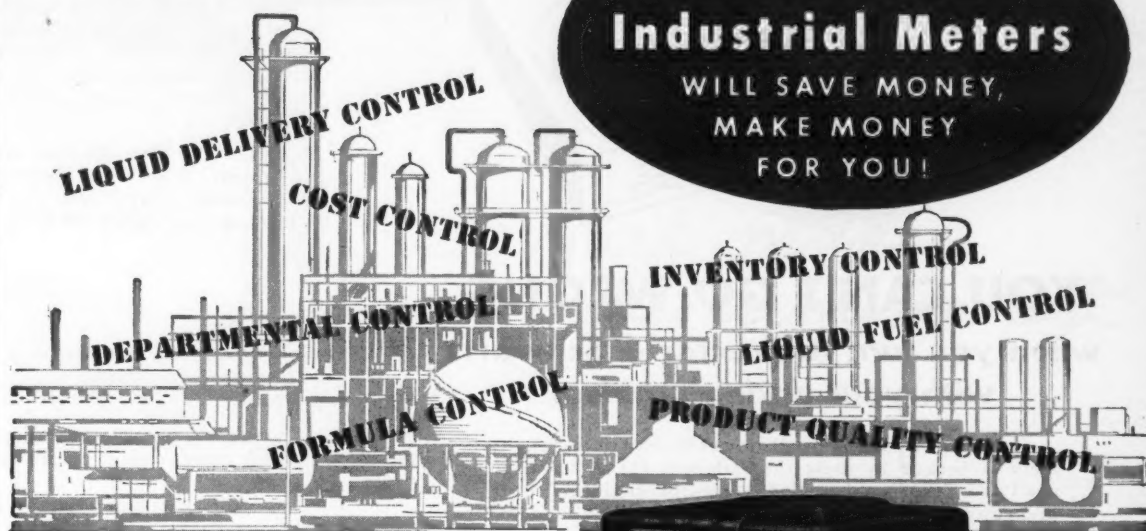
There are three compositions of copper-tin bronze-alloy deposit recommended for different purposes. One composition produces a ductile plate (Knoop hardness 260-280) particularly effective as a bearing overlay.

Another composition is a slightly harder gold-yellow plate that is said to be an excellent undercoat for decorative plating. Chromium can be plated directly on this plate after buffing, or after depositing a thin bright nickel plate. This composition plus chromium is reportedly superior to an equal thickness of copper plus chromium in protecting steel against corrosion.

A third composition produces a silvery, hard (about 400 Knoop) plate resistant to tarnish and scratching.

(Information on the Lustralite process courtesy of Battelle Memorial Institute, Dept. CP, 505 King Ave., Columbus 1, Ohio.)

# ALL OVER THE PLANT... YOUR PLANT!



## ROCKWELL Industrial Meters

WILL SAVE MONEY,  
MAKE MONEY  
FOR YOU!

Wherever valuable liquids are stored, mixed or consumed, you will be way ahead to measure them with Rockwell industrial meters. They provide *accurate* records to verify your purchases, to stop losses. They guard the quality of your formulations when blending, mixing, batching. Your accountants will welcome meter records for cost control and tax analysis purposes. These same records will enable you to keep tab on all liquid inventories. There is a size and type of Rockwell meter to measure most any liquid that can be piped—oils, chemicals, paints, liquors, solvents, etc.—even corrosive fluids. Automatic shut-off valves and remote registration systems are available. For full facts use the handy coupon or write for bulletins.



Rotocycle meter, cut away to show the all-revolving rotor construction.

## NOW A STAINLESS STEEL METER

FOR MEASURING CORROSIVE LIQUIDS

This Rockwell Model 2-BC meter is constructed *inside and out* of stainless steel. It resists corrosion. Rated capacity 100 gpm. This is an ideal meter for measuring liquids entering into foods and pharmaceuticals—also chemicals and corrosive liquors. Write for bulletin OG-403.

YOU CAN RELY ON ROCKWELL



CLIP COUPON—MAIL TODAY

ROCKWELL MANUFACTURING COMPANY

5402A

Pittsburgh 8, Pennsylvania

Gentlemen:

I am interested in measuring

(Name of Liquid)

Pipe Size

Working Pressure

Temperature °F max.

Max. Flow Rate

Min. Flow Rate gpm.

YOUR NAME

COMPANY

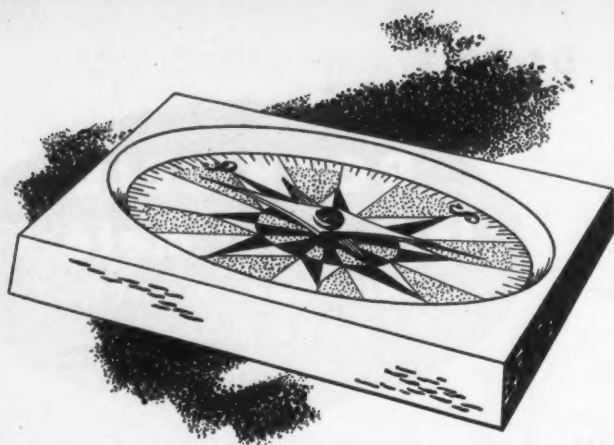
STREET

CITY

ZONE STATE

When inquiring check CP 8532 on handy form, pgs. 2-3





## YOU CAN'T GO WRONG when you turn to Proctor & Schwartz with your drying problem

Here's why. Every installation of Proctor drying equipment is backed by these three things: (1) A thorough analysis of the problem... (2) Proctor engineers' comprehensive knowledge of sound dryer design... and (3) Their reputation for installing systems that perform according to guaranteed specifications.

For example—on one occasion we were the fifth company called in. By then, the others had promised drying capacities which we knew were unrealistic. We persuaded the prospect to request all five of us to make laboratory tests.

On the basis of the tests, P&S recommended a drying system that gave a somewhat lower capacity, but, one which our tests had proven to be the maximum consistent with good results. Our competitors' tests showed the same figures.

P.S.—P&S got the order, largely for having suggested the tests. The management knows we saved them from making promises of delivery that they never could have met.

Call Proctor engineers *FIRST* when you have a drying problem. In the meantime write for Bulletin No. 390.

## PROCTOR & SCHWARTZ, INC PHILADELPHIA 20, PA.

The World's First Name in Industrial  
Drying Equipment and Processing Machinery

TRAY DRYERS • TRUCK DRYERS  
CONTINUOUS CONVEYOR SYSTEMS • PRE-FORMING FEEDS  
INFRA-RED FREEZE DRYING SYSTEMS • SPRAY DRYING

When inquiring check CP 8533 on handy form, pgs. 2-3

## ENGINEERING & MAINTENANCE

### Explains how revolving air effects heat transfer

Principles of Cyclonic Combustion method of heat transfer are explained in 4-page bulletin. Drawings show how air is introduced into combustion chamber at extremely high speeds in a revolving spiral vortex, radiating heat to the fire tube through direct radiation or convection. Manufacturer claims resultant high rate of heat transfer reduces necessary heating surface to 3 sq ft per boiler hp.

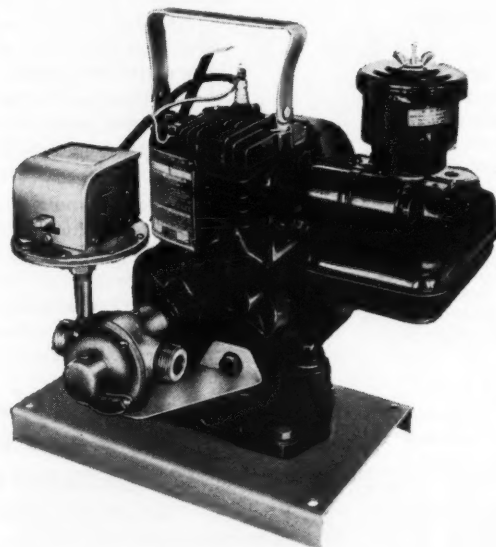
Pamphlet "All Your Questions Are Answered by Cyclotherm" is available from Cyclotherm Div., U. S. Radiator Corp., Dept. CP, Oswego, N. Y. When inquiring specify CP 8534, pages 2 and 3.

### Weighing only 35 pounds, gasoline-powered pump is portable...

unit may be operated unattended since vacuum switch guards against burned out impeller

Uses: For beverage, water or liquid chemical transfer.

Features: Gasoline-powered pump is portable, weighing only 35 lb complete with engine, fuel tank, hinged carrying handle and base plate.



Capacity of pump is up to 8 gpm

Description: Hollow shaft pump, Model G 3800 VS, mounts directly on drive shaft of a Model 5S 1-hp Briggs & Stratton gasoline engine and will run for 1-3/4 hours on a tank of fuel. Unit shown is equipped with vacuum switch to guard against burned out impellers when liquid supply runs dry. Use of switch means that pump may be operated unattended and will shut itself off when pumping job is finished.

## ROSS HIGH SPEED MILLS WILL CUT YOUR PRODUCTION COSTS



### NEW ROSS #52T— THREE ROLL MILLS

prove time and again to give maximum output with highest quality grinding or dispersion results.

The ease of operation, increased production features, and rugged construction of ROSS mills are worth investigating to see why ROSS is the leading mill in plants throughout the country.

### Compare these features built into every ROSS Mill:

1. Highest grade rolls precision ground and tested for maximum hardness. Thin wall construction with large full length cooling chambers.
2. Increased roll speeds for higher production with special differential speeds for maximum shear.
3. Newly designed hopper quickly adjusted or removed for cleaning. Dual adjusted end plate regulator optional.
4. Solid one piece cast iron frame eliminates vibration, assures rigidity and perfect roll alignment under all conditions.
5. Motor mounted inside mill frame. Two speed motors when required.
6. Extremely quiet operation with heavy SKF self-aligning roller bearings throughout and helical gears operating in continuous oil bath lubrication.
7. Balanced apron prevents scoring of rolls. Uniform pressure of thin razor knife gives clean takeoff without heating.
8. Special bearings in handwheels facilitate rapid setting or disengaging of rolls. Parallel settings obtained with indicating dials for sensitive accurate adjustment. Setting is direct, has no intermediate wearable parts, will not lose effectiveness or accuracy.

Available in 4 1/2 x 10, 6 x 14, 9 x 24, 12 x 30, 14 x 32 and 16 x 40 inch sizes. Write for further details!

Information on our guaranteed re-conditioning service for mills of all types on request.

**CHARLES ROSS  
& SON COMPANY**  
154 CLASSON AVENUE  
BROOKLYN 5, N. Y.

When inquiring check CP 8535 on handy form, pgs. 2-3

CHEMICAL PROCESSING

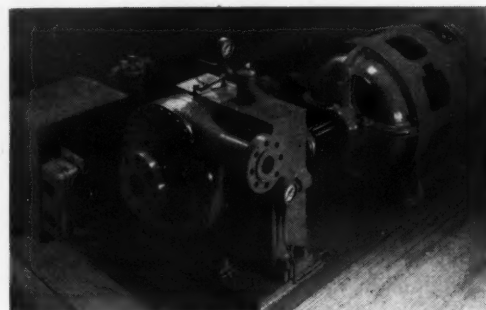
Capacity of pump is up to 8 gpm open discharge. Pressure range of pump is up to 30 lb. It will lift water up to 10 ft unprimed, 22 ft primed, and has outside threaded ports to accommodate hose couplings.

(Portable pump is a product of Dept. KP, Hypro Engineering, Inc., Dept. CP, 404 N. Washington Ave., Minneapolis 1, Minn. . . or for more information check CP 8536 on handy form, pages two and three.)

#### High temps and pressures, low flow handled by recycle compressor

Manufacturer has announced a line of centrifugal recycle compressors. Design is standardized to meet all recycle requirements in a range from 25 to 250 hp, flow as low as 100 scfm, pressure as high as 600 psig, and temperatures up to 700°F.

Housings, impellers, diffusers, bearings, gears, and shafts are standardized and interchangeable. Three standard impeller types are available: non-overloading, high pressure, and non-surfing.



Compressors have standardized interchangeable parts

Units give oil-free compression, eliminating oil separators and cleaner lines, and cutting maintenance to gas handling system.

(Recycle compressors are a product of Sawyer Bailey Corp., Dept. CP, 1559 Niagara St., Buffalo, N. Y. . . or for more information check CP 8537 on handy form, pages 2 and 3.)

#### Application of aluminum jacketing specified in drawing

Weatherproofing of insulated ells, tees, and bends on pipe lines using aluminum jacketing is explained in drawing. Three practical methods for the job are illustrated.

Drawing E-130 is available from Childers Mfg. Co., Dept. CP, 3620 West 11th St., Houston 8, Texas. When inquiring specify CP 8538 on handy form, pages 2 and 3.

## if you want lower V-Belt costs —



When a V-Belt bends,  
you can feel its sides  
change shape.

*just make  
this simple test*



Take any V-belt that has straight sides (Fig. 1). Bend that V-belt while you grip its sides with your fingers. You will feel the sides bulge out (Fig. 1-A). Clearly, that out-bulge forces the belt to press unevenly against the V-pulley—and this concentrates wear at the points shown by arrows (Fig. 1-A).

#### Now bend a Gates Vulco Rope with CONCAVE SIDES (Fig. 2)

(U. S. PAT. NO. 1813698)



Instead of bulging, the precisely engineered CONCAVE SIDES merely fill out and become perfectly straight. This belt, when bent, precisely fits its sheave groove (Fig. 2-A). The sides of the Gates Vulco Rope press evenly against the V-pulley. Therefore, wear is distributed uniformly across the full face of this belt—resulting in longer belt life and lower belt costs for you!

When you buy V-belts, be sure to get the V-belt with the Concave Sides—the Gates Vulco Rope!



VULCO ROPE  
**DRIVES**

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

THE GATES RUBBER COMPANY  
DENVER, U. S. A.

CS-543

When inquiring check CP 8539 on handy form, pgs. 2-3



**Want a pump something  
at lower cost?**

**CHECK HERE**

Air	Dye Solutions	Latex	Salt Water
Alcohol	Edible Oils	Mash	Shortening
Ammonia	Ethane	Methane	Sludge
Beer	Fish Oils	Milk	Soap
Benzol	Formaldehyde	Molasses	Sodium Chloride
Boiler Feed Water	Fresh Water	Naptha	Solution
Brewer's Mash	Gas, Manufactured	Nitric Acid	Sodium Silicate
Butter	Gas, Natural	Nitrogen	Sodium Sulfate
Butane	Gasoline	Oil, Crude	Solution
Cane Syrup	Glucose	Oil, Refined	Starch
Calcium Carbonate	Glycerine	Oxygen	Sulphuric Acid
Slurry	Glycols	Paint	Sump Water
Calcium Sulfate	Hydrochloric Acid	Potassium Hydroxide	Sweet Water
Slurry	Hydrofluoric Acid	Propane	Tomato Juice
Casein Solutions	Ink	Raw Boiler	Varnish
Cement Slurry	Jam	Feed Water	Vinegar
Chocolate	Jelly	River Water—Dredging	Viscose
CO <sub>2</sub> Gas	Ketchup	Operations	Water (various)
Crude Oil	Lacquer	Rosin	Wax
Dairy Products			Whey

**T**HIS list of fluids will give you a rough idea of the diversity of pumping jobs in which Darcova Pumcups are responsible for really big savings.

It boils down to the fact that Pumcups all but eliminate fluid slippage *throughout* their life span . . . and they last many times as long as other packings. Think of the down-time avoided, the production gains due to prolonged high efficiency, and the time-and-money-saving reduction in maintenance!

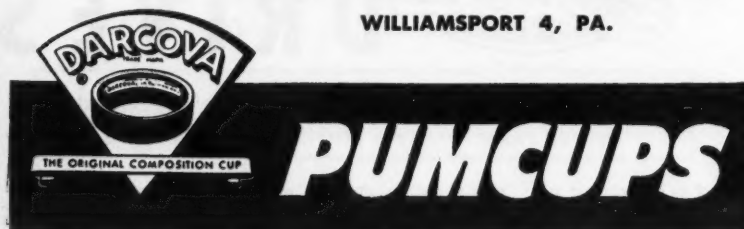
Years of application research have gone into the development of Pumcups. Made today in standard as well as many special compositions and textures for a wide range of temperature and pressure conditions, they offer you superior cost-cutting service in virtually any pumping job, simple or tough! And they're available in diameters from 1 to 20 inches.

**SEND FOR FREE BULLETIN**

Why not weigh *all* the facts? Bulletin 4401 covers Darcova Pumcups for reciprocating pumps; Bulletin 4502 on Pumcups for air or hydraulic mechanisms. Write for yours today.

**DARLING VALVE & MANUFACTURING CO.**

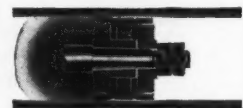
**WILLIAMSPORT 4, PA.**



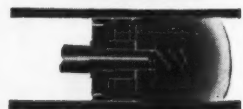
**DIAGRAM OF DARCOVA PUMPCUP ACTION** (greatly exaggerated)



**NORMAL: BOTH PUMCUPS RELAXED**



**UNDER PRESSURE: PUMCUPS SEAL AGAINST CYLINDER DESPITE WEAR, MINIMIZING SLIPPAGE**



**MAINTENANCE**

**Drum sides are heated evenly by unit which "wraps around" . . .**

sited to substances that might be damaged by overheating

**Uses:** For five-gallon drum-heating applications. Unit is especially suited\* to heating substances which might be damaged by overheating.

**Features:** Heat is applied uniformly at every point around drum sides, and can be of such a degree that melting points are not necessarily exceeded.

**Description:** Heater simply wraps around drum and is held securely with snap fasteners. A blanket of fibrous glass can be used to surround heater and drum, thereby increasing heat-up speed.

Heaters are constructed of alloy resistance wire, covered with suitable insulation for electrical safety and an outer braid for wear resistance.



Heater snaps firmly in place around drum

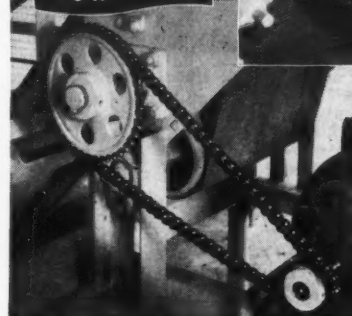
Shown in photo is a 300w heater for melting chemical plastisols. In this case wire is insulated with glass and silicone, with tough nylon outerbraid. It plugs into a 115v circuit. Other sizes and ratings can be built to fit a wide range of operating conditions.

(Drum heater is a product of Pre-Fab Heater Co. Inc., Dept. CP, Guilford, Conn. . . . or for more information concerning manufacturer's product, reader may simply check CP 8541 on handy Reader Service slip which is located between pages two and three.)

**the same *HIGH* efficiency  
at *ALL* speeds with**

**DIAMOND  
ROLLER  
CHAIN  
DRIVES**

**LOW SPEED**



**HIGH SPEED**



- 98-99% Efficiency Maintained.
- No Slip or Creep — Diamond Roller Chains are as positive as gears.
- Load Shared by many Sprocket Teeth.
- Stress on Bearings Reduced — and no separating forces as with gears.

Experienced machinery design engineers and production men realize the importance of high maintained efficiency of power transfer with the result that Diamond Roller Chains are in greater use today than ever before. Precision manufacture of every part, — side plates, rollers and bushings assure uniform high quality, long-life smooth performance. Catalog 709 gives useful data and information; copy mailed on request.

**DIAMOND CHAIN COMPANY, Inc.**

*Where High Quality is Traditional*

Dept. 411, 402 Kentucky Ave., Indianapolis 7, Indiana

*Offices and Distributors in All Principal Cities*

Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER



When inquiring check CP 8542 on handy form, pgs. 2-3

**CHEMICAL PROCESSING**

**Adhesive is pressure sensitive to itself, but not to uncoated surfaces . . .**

permits cold combining of coated surfaces after a month's delay

**Uses:** For bonding wood, wood fiber board, felts, fabrics, and other porous and semi-porous materials, including package closures, by simple pressure.

**Features:** Compounded rubber latex adhesive is described as having characteristic of pressure sensitivity to another film of same adhesive, but not to uncoated surfaces. This is said to permit cold combining of two coated surfaces of any kind desired with delay of periods up to one month between coating and combining, if necessary.

**Description:** Syntex L-852 is a water base adhesive, providing non-flammability during application. It may be applied by either brush, spray, or flow gun with coverages from 300 to 450 sq ft/gal depending on nature of surfaces coated. A thin film becomes dry in about one hr or less and is brown in color.

Recommended temperature for storage and application is above 45°F. Adequate pressure to assure complete contact between opposing surfaces is likewise recommended.

Adhesive is said to provide a firm and flexible bond over a wide range of temperatures from -10°F to 150°F, with good moisture resistance provided contact with water is not constant. Dried film maintains its pressure sensitivity to a like adhesive film for a long period.

Viscosity of material as supplied is approximately 200 cps for 45% solids, and weighs 8.7 lb/gal. It is available in 1, 5 and 55 gal containers.

(Adhesive is a product of The Flintkote Company, Industrial Products Division, Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. . . or for more information check CP 8543, pages 2 and 3.)

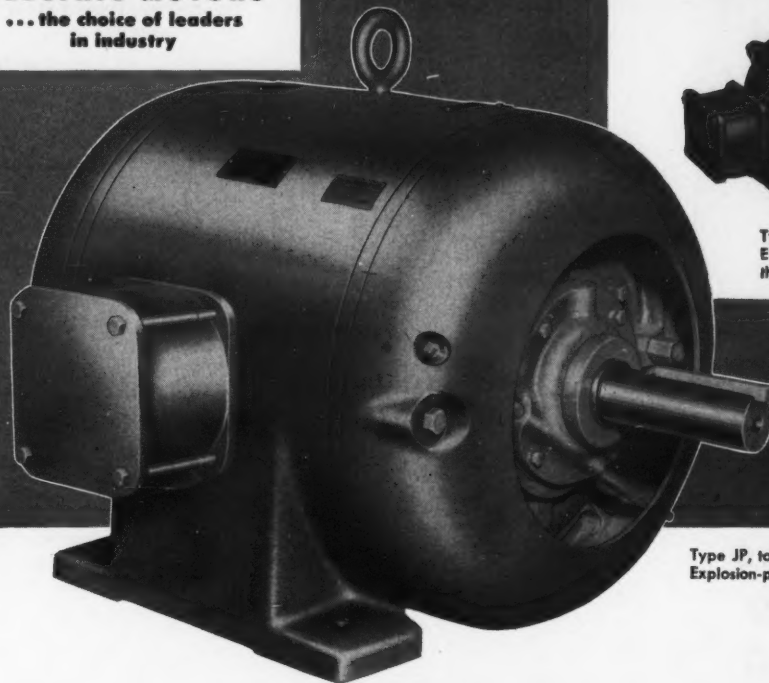
**Points way to easier methods of power plant cleaning**

Compact, 42-page handbook gives methods, solution concentrations, and temperatures used in various plants for such jobs as cleaning and descaling surface condensers and heat exchangers. Booklet is conveniently divided into sections on cleaning equipment in steam central stations, diesel and electric power plants, and descaling.

Also discussed are methods of stripping paints of all kinds from different surfaces. Sections are included on steam detergent cleaning, maintenance cleaning of floors, painted equipment, and lavatories. Drawings and photographs of methods and equipment illustrate text. A complete index is included for easy reference.

"How to Make Power Plant Cleaning Easier" is issued on letterhead request to Oakite Products, Inc., Dept. CP, 118F Rector Street, New York 6, New York.

**Wagner®**  
**ELECTRIC MOTORS**  
... the choice of leaders in industry



Type JP, non-ventilated. Explosion-proof. ½ through 1½ hp.

Type JP, totally-enclosed fan-cooled. Explosion-proof. 2 to 250 hp.

**for extra protection against corrosion**  
**SPECIFY Wagner CAST IRON FRAME MOTORS**

Here are stock motors specifically designed for use in chemical plants, oil fields, refineries, steel mills—for rugged industrial applications where dust, dirt, moisture, or corrosive vapors are present.

These motors are totally-enclosed in corrosion-resistant cast iron and all parts exposed to the atmosphere are of corrosion-resistant material—including the nameplate. They feature completely protected laminations . . . special varnish treated windings . . . and a running shaft seal.

Wagner Cast Iron Frame Motors are available in fan-cooled standard and explosion-proof types in ratings from 2 to 250 hp, and in non-ventilated standard and explosion-proof types in ratings from ½ through 1½ hp. Wagner Bulletin MU-132 gives complete information.

A skilled Wagner engineer can help you select a Wagner Motor to meet your most exacting specifications. Call the nearest of our 32 branch offices, or write us.



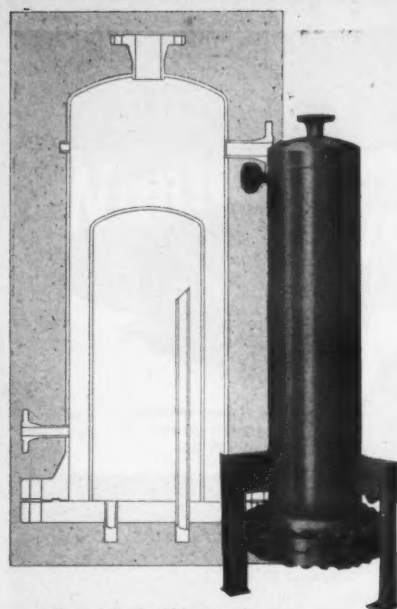
WAGNER ELECTRIC CORPORATION  
6359 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

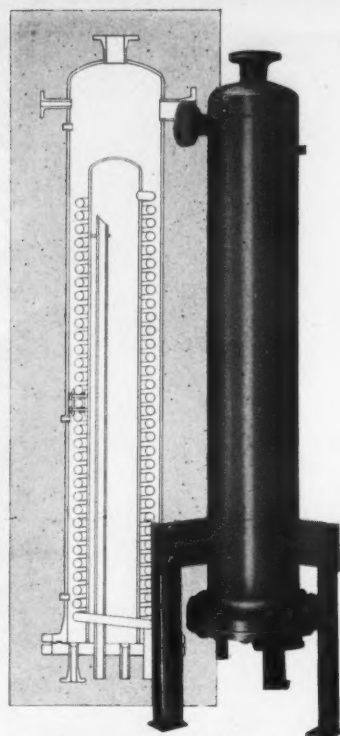
ELECTRIC MOTORS  
TRANSFORMERS  
INDUSTRIAL BRAKES  
AUTOMOTIVE  
BRAKE SYSTEMS—  
AIR AND HYDRAULIC

When inquiring check CP 8544 on handy form, pgs. 2-3





Gussett-built Chlorine Vaporizer,  
300 p.s.i. working pressure.



Gussett-built Carbon Tetra-  
chloride Diluent Vaporizer.

## YOU CAN TRUST YOUR TOUGH FABRICATED PROCESSING EQUIPMENT JOBS TO

In forty years of fabricating equipment for all segments of industry, Gussett has learned much about the requirements of all types of service.

With one of the most modern and complete fabricating plants backed by comprehensive engineering service, Gussett can put this "know-how" to work to fabricate your special equipment efficiently, economically, promptly and to your full satisfaction. The tougher the problem, the better we like it.

Your design prints, description or service requirement data is all we need to quote and put the job in production. If you wish, we'll be happy to send a representative fully qualified to help you work out the details involved.

May we figure on your next job?

### WRITE FOR THIS FILE BULLETIN

with a complete listing of Gussett facilities and capabilities. You'll find it helpful in planning your fabricating jobs.

## GUSSETT BOILER & WELDING, INC.

1545 WHIPPLE RD. S. W.  
CANTON 10, OHIO

Plain or Lined Tanks • Accumulators • Bins • Catalyst Columns • Chutes  
Caustic Strippers • Condensers • Coolers • Evaporators • Pressure Vessels  
Fractionating Towers • Jacketed Kettles, Tanks and Pipe • Code Vessels  
Process Piping • Scrubbers • Stills • Vulcanizers • Machine Bases & Frames

When inquiring check CP 8545 on handy form, pgs. 2-3

## MAINTENANCE

### Dry pigment lubes added to Teflon sealer for low-temp service . . .

provide for lower thread seal-  
ing torques

**Uses:** For specialized thread  
sealing applications.

**Features:** Teflon-base thread-  
sealing compound can be furnished  
with added dry pigment lubricants,  
such as graphite, molybdenum sul-  
fide, lead or copper. Stabilized  
pigment dispersions provide for  
lower sealing torques, especially in  
low-temperature applications.

**Description:** Compound, called  
T-film, forms a continuous film,  
preventing spiral wicking and leak-  
age of material being conveyed.  
It is suitable for metallic and plas-  
tic threaded connections in all pro-  
cess pipe lines and apparatus.

It seals leak-proof against fluids  
and gases under pressure, yet per-  
mits joints to be easily broken  
when necessary, eliminating galling  
and sheared threads. Material is  
suitable for temperatures from  
minus zero to plus 400°F. It is  
offered in 2- and 4-oz jars.

(Thread-sealing compound is a  
product of Eco Engineering Co.,  
Chemical Products Div., Dept. CP,  
12 New York Ave., Newark, New  
Jersey . . . or for more information  
check CP 8546 on handy form,  
pages 2 and 3.)

### Details easy-operating butterfly valves

Butterfly valves manufactured  
from heavy-duty fabricated steel  
or from various non-corrosive  
materials are described in six-  
page circular. Oil-sealed ball  
bearings in louver shaft housing  
assure free and easy opening  
and closing of louver. Construc-  
tion, operation, and dimensions  
of units offered are detailed.  
Valves are available in 6 to 96"  
pipeline sizes in fabricated steel  
— 3 to 48" pipeline sizes in  
cast iron.

Butterfly Valve circular is avail-  
able from S. P. Kinney Engi-  
neers, Inc., Dept. CP, 201  
Second Ave., P. O. Box 445,  
Carnegie, Pa. When inquiring  
specify CP 8547 on handy form,  
pages 2 and 3.

## 5 mm to 10 Microns ...or Better!

There's a Beach-Russ Rotary Vacuum  
Pump to meet your requirements in dry  
or wet operations.

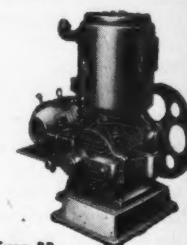
### Faster Pump-down... Longer Service

With the superior mechanical  
efficiency of Beach-Russ Type SS  
or Type RP Pumps, you get  
down to your working vacuum  
faster...and gain all the advan-  
tages of long service life with  
minimum maintenance costs.

### Are You on the "Much Ado About Nothing" Mailing List?

If you do not get this regularly  
issued, highly informative house  
organ on high vacuum and its  
uses, just ask us to put your name  
on the mailing list.

Type SS...  
for vacuum up to 5mm on light  
systems, for dry or semi-wet  
work. Capacities 6 to 375 c.f.m.



Type RP...  
for vacuum up to 10 microns  
or better on dry or wet work.  
Capacities 17 to 845 c.f.m.

## BEACH-RUSS COMPANY

50 CHURCH STREET • NEW YORK 7, N. Y.

Address Department 46

When inquiring check CP 8548 on handy form, pgs. 2-3

**SPRACO  
NOZZLES**

Write for NOZZLE CATALOG to  
**SPRAY ENGINEERING CO.**  
125 CENTRAL STREET • SOMERVILLE 45, MASS.

When inquiring check CP 8549 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Hydraulic-magnetic overload relay data provided in bulletin**

Engineering data, model specifications, and information on applications of overload relays are provided in 4-page bulletin. Description of hydraulic-magnetic operating principle is given along with data on hermetically sealed time element. General dimensions and specifications of all models are given and details of typical applications in protecting a 3-phase air-conditioning compressor motor are provided.

Bul No. 5101A is issued by the Heinemann Electric Co., Dept. CP, 332 Plum St., Trenton 2, N. J. When inquiring specify CP 8550 on handy form, pages 2 and 3.

**Damage from gas or electric failure prevented with flame pilot . . .**

unit causes instantaneous feed cut-off when pilot is extinguished

**Uses:** For protection of any gas fired appliance against damage from failure of gas pilot, gas, or electric supply.

**Features:** Device uses flame conductivity principle to achieve instantaneous cut-off after pilot flame failure. No vacuum tubes are required.

**Description:** Unit was designed for application to ovens, air heaters, immersion heaters, furnaces, metal pots, and other industrial gas burning appliances which utilize constantly burning gas pilot.

Pilot burner is provided which is fitted with built-in flame-sensing electrodes and is easily installed as single unit. Special fittings allow this burner to be installed on most gas burning equipment, with little alteration.

Push button electrically ignites pilot burner. In the automatic models, ignition takes place mechanically after a preset purge time delay.

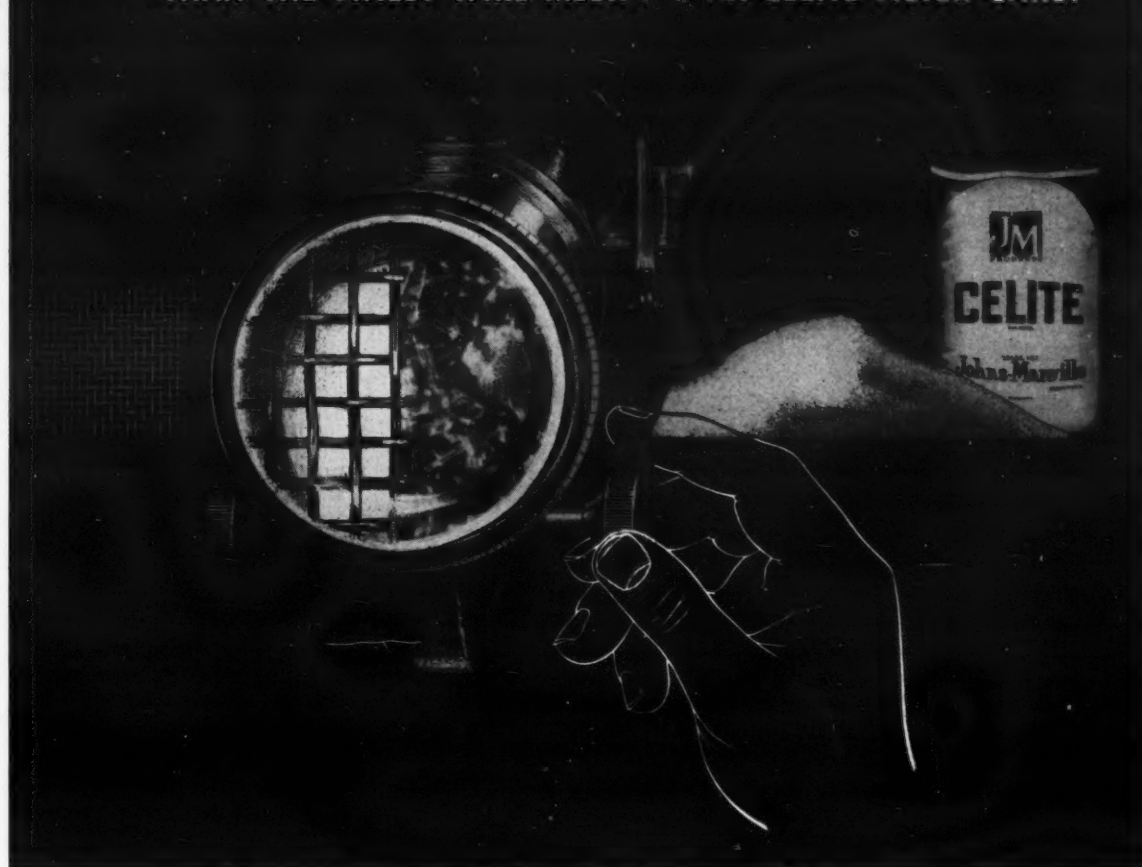
Unit makes use of the ability of gas flame to conduct electrical currents better than air. By placement of suitable electrodes in pilot gas flame, small electric current flows across pilot flame and ceases when flame is extinguished. This current operates relay which controls electrically operated valves in fuel line. When pilot is extinguished, entire fuel supply is instantly cut off. Since it does not depend upon heat generated by pilot for its operation, there is no delay in function.

No auxiliary spark plug is required since pilot burner ignites electrically from its own electrodes. Construction of burner makes it possible to operate on all kinds of gas — manufactured, natural or mixed. Complete unit consists of control cabinet, transformer, and pilot burner with air mixer. Models are available for 110 volts, 60 c AC only.

(Saf-T-Flame Pilot is a product of The Partlow Corp., Dept. CP, New Hartford, N. Y. . . or for more information check CP 8551 on handy form, pages 2 and 3.)

HUNDREDS OF TIMES FINER

THAN THE FINEST WIRE MESH . . . A CELITE FILTER CAKE!

**With Celite Filtration you are assured perfect clarity**

**H**ERE is a clarification method which can remove even the finest suspended solids . . . a Celite\* Filter Cake contains more than 2,500,000 filter channels per square inch of surface. Here, too, is a method so flexible that it permits the right balance of fast flow rate and high capacity, with the degree of purity and clarity required.

Celite powders may be used with any type of conventional filter. Only 2 simple steps are required. First, a "pre-coat" of Celite is deposited on the filter medium. Second, small amounts of Celite are added to the solution, to form a con-

tinuously fresh filter surface. To meet different filtration requirements, Celite is available in nine standard grades of microscopically controlled particle size. Utmost uniformity is assured by exclusive processing techniques.

The extraordinary efficiency and flexibility of Celite Filtration have made it the standard for entire industries. For perfect clarity in food products such as jellies, sugar, wine, beer . . . for highest purity in antibiotics . . . for removal of impurities from chemicals, petroleum, dry cleaning solvents . . . Celite offers unequalled advantages.

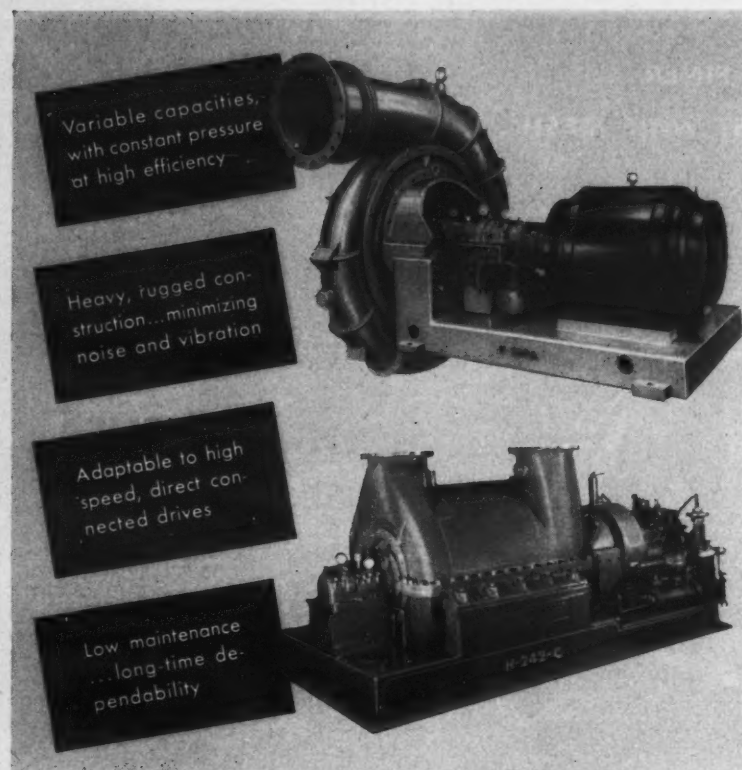
If you want to improve your present filtration system or find an economical way to utilize filtration in your processing, investigate the Celite method now. One of the Johns-Manville Celite Filtration Engineers will gladly discuss your problem. These men are backed by complete technical services and the Johns-Manville Research Center, largest laboratory of its kind in the world. For further information write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

\*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.

**Johns-Manville CELITE FILTER AIDS**

When inquiring check CP 8552 on handy form, pgs. 2-3





## LOOK FOR THE "BIG 4" WHEN YOU BUY CENTRIFUGALS

Your specific needs may dictate other important characteristics in centrifugal blowers or exhausters. But even so, these four values are essential to over-all successful performance. You'll find them in every Roots-Connersville Centrifugal Unit, regardless of size. And if you desire variations to suit your application, the ability to meet these needs is a heritage of our 100 years' specializing in equipment to handle gas and air.

You'll find first-cost economies, too, in the wide range of capacities of R-C Centrifugals. From 2,000 cfm to 100,000 cfm, you can choose the single-stage or multi-stage unit most closely matched to your individual requirements. You can count on the same high quality of performance that has made many thousands of first-time buyers enthusiastic, repeat customers for R-C equipment.

For your present or future requirements, we suggest you call on Roots-Connersville, for 100 years the specialists in handling gas and air.



### ROOTS-CONNERSVILLE BLOWER

A DIVISION OF DRESSER INDUSTRIES, INC.  
554 Richland Ave. • Connersville, Ind.



**Specialists in handling gas and air**

When inquiring check CP 8553 on handy form, pgs. 2-3

## MAINTENANCE

### Economical pipeline blinds and spacers easily identified

**Uses:** For blind and spacer ring applications in oil refineries, petrochemical plants, tank farms, distributing plants, pipeline testing.

**Features:** Because blinds and spacer rings extend beyond pipe flanges, it is easy to identify whether unit is blind completely sealing flow shut-off or a spacer ring providing an open flow.

To further simplify ready identification, blinds have blank discs at end of tab while spacer rings have an open ring at end. Tabs have no lettering that can become obscure by grease, oil, dirt, or usage.

**Description:** Blinds and spacer rings, called Visi-Tabs, are standard, mass-production items. There are sizes for all standard pipelines, for raised face, ring-type joints, and tongue and groove flanges with a full range of ASA service pressure and temperature ratings including 150 to 2500 psig.



Blind (top) and spacer ring are compact, have no lettering to become obscured

Units can be furnished in carbon steel, carbon moly, chrome moly (to all ASTM plate and forging specifications), stainless steel (types 316, 304, 347), monel, alloy-faced carbon steel and various other special alloys.

(Blinds and spacer rings are a product of Engineering Corp. of America, Dept. CP, P. O. Box 209, Westfield, N. J. . . . or for more information concerning manufacturer's product, reader may simply check CP 8554 on handy form which is located between pages two and three.)

**OSTER**

**LIGHTWEIGHT CHAMP**

Makes Dies Work Better... Longer

Dies last longer in the Oster Lightweight Champ because it has two driving arms on center line with spindle. They even up the load on die stocks . . . prevent excessive strain and wear on one side of the die.

Other features also help make it an outstanding value. A new wrenchless chuck grips and holds tight in either right or left hand direction; revolving non-binding rear chuck; indestructible all welded steel case. The standard range is 1/8" to 2". Range with drive shaft is 2 1/2" to 8".

For complete data, write us or, better still, contact your local Oster distributor.

**THE OSTER MANUFACTURING CO.**  
Main Office and Factory:  
2032 East 61st St. • Cleveland 3, Ohio

*Builders of Cost Reducing Threading Equipment Since 1893*

When inquiring check CP 8555 on handy form, pgs. 2-3

**NO DOWNTIME**

*in over a year using*

**a PLATECOIL in**

*REPLACES PIPE COIL*

**a parkerizing tank**

The only time this Platecoil was removed in over a year was to take its picture. The single 22" x 23" Platecoil has heated a 100-gallon Parkerizing tank, in daily use, *without downtime* at the Lycoming Spencer Division of Avco Corp. Built of Electro-Polished Stainless Steel, the Platecoil has required no cleaning or repairs. Platecoils will replace pipe coils at a savings in any heat transfer application.

Send for complete  
technical manual and  
descriptive Bulletin No. P54



When inquiring check CP 8556 on handy form, pgs. 2-3

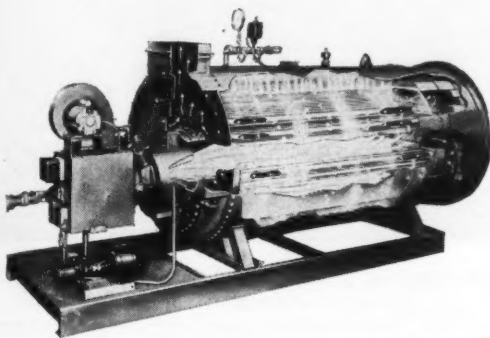
CHEMICAL PROCESSING

**No pushing or strain at maximum 125-hp rating with automatic packaged boiler . . .**

has controls for all operating requirements

**Uses:** For commercial and industrial heating and processing applications.

**Features:** It is reported that boiler has larger than average steam space, combustion area, water storage area, and heating surface. Tests are said to prove that unit permits extremely high heat output without strain or danger of heat cracks. It produces hot dry steam, and has extra reserve capacity to eliminate fluctuations in steam pressure. Boiler develops rated horsepower efficiently under normal operating conditions.



Cutaway shows heat flow in packaged boiler

**Description:** "Steamboilerplant" is available with automatic controls for all operating requirements. Design and construction equals or exceeds all latest requirements of ASME Code and "Code of Ethics" of Industrial Gas Equipment Division of GAMA.

Completely assembled boiler is ready for immediate operation after electricity, steam, water, fuel and stack are connected. All necessary wiring is complete.

Unit is available for burning gas, gas or light oil, gas or heavy oil, oil only, and for heavy oil only (requiring preheat).

(Packaged Scotch-Marine Boiler is a product of Eclipse Fuel Engineering Co., Dept. CP 1002 Buchanan St., Rockford, Ill. . . or for more information, check CP 8557 on handy form, pages 2 and 3.)

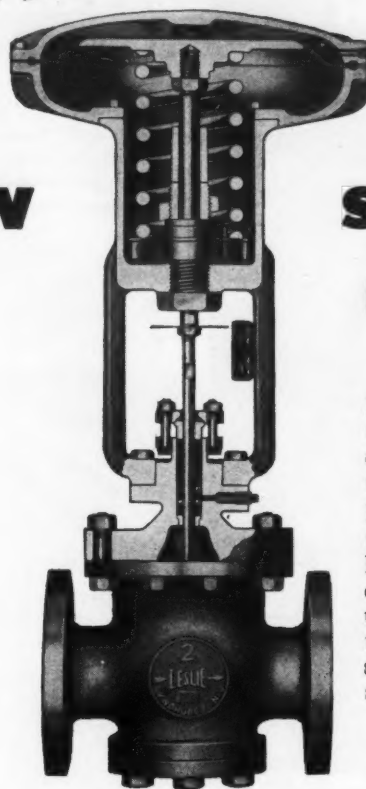
**Rubber blend sheet offered in widths to four ft — to one inch thick**

Manufacturer has announced availability of Ampcolite (styrene rubber blend sheet) in widths up to 48" and thicknesses up to one inch.

(Rubber sheet is a product of The Atlas Mineral Products Co., Dept. CP, 26 Walnut St., Mertztown, Pa. . . or for more information check CP 8558 on handy form, pages 2 and 3.)

something **SPECIAL** in a **STANDARD** control valve . . .

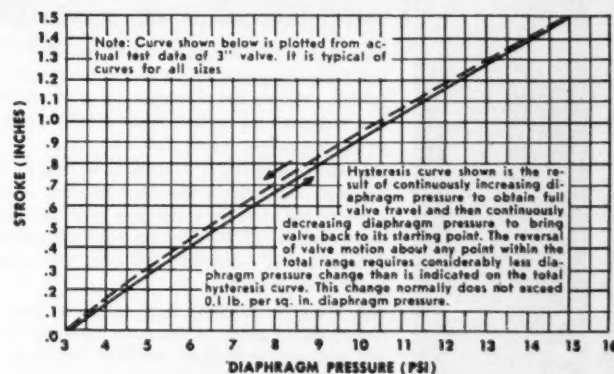
**NEW**



## **SUPERSTRUCTURE FOR LESLIE DIAPHRAGM CONTROL VALVES**

Now standard for *all* Leslie Diaphragm Control Valves, this new rugged, precision stroke, superstructure means even more reliable performance than the high level set in the past by Leslie.

For instance, linearity (the straight line relationship between diaphragm pressure and inner valve movement) is held to plus or minus 2% for valve strokes up to 1½" — equivalent to .020" for valves with 1" stroke without using valve positioner. Hysteresis, the difference in position of the inner valve on the up and down strokes for the same diaphragm pressure, is held to 2% of full valve stroke for travel up to 1½". Here is the curve.



**Only Leslie gives you all of these "made-to-order" advantages in a standard valve.**

- ✓ Full-flow, smoothly contoured body
- ✓ Renewable, interchangeable seat rings
- ✓ Bolted stuffing box
- ✓ Molded rings or Teflon packing
- ✓ Thermo-insulating bonnet
- ✓ Accurate part replacement from name plate data
- ✓ Stem flats for ease of connection

**Send for**

Bulletin 5304 (Single Seated Diaphragm Control Valves)  
Bulletin 5305 (Double Seated Diaphragm Control Valves)



**LESLIE CO., 281 Grant Avenue, Lyndhurst, New Jersey**

When inquiring check CP 8559 on handy form, pgs. 2-3



# Impervite

IMPERVIOUS GRAPHITE

## HEAT EXCHANGERS



Photo shows 7-tube, single pass, 9-foot long IMPERVITE heat exchangers installed in the production facilities of a large manufacturer of agricultural, industrial and pharmaceutical chemicals. Over 50 IMPERVITE heat exchangers are currently in use at this plant as reflux condensers on acid vapors from organic reactions.

The Chief Engineer states, "Previously we used an acid resistant heat exchanger that weighed four times as much as the IMPERVITE exchangers, and which had a little over twice the transfer surface. When we changed to IMPERVITE, we got better performance, a reduction of 75% in cost of installation, and almost a complete elimination of maintenance expense."

High efficiency IMPERVITE heat exchangers from 7 to 241 tubes feature highest quality workmanship and design. Available for single and multi-pass applications, IMPERVITE exchangers are used as pre-heaters, boilers, condensers, coolers and absorbers in a wide range of processing work with acetic acid, ammonium sulphate, caustic soda, hydrochloric acid, sulphuric acid, chlorination etc.

IMPERVITE tubes are extruded by an exclusive new method which almost completely eliminates laminations. The resulting IMPERVITE tubing provides maximum uniform heat transfer and will not spall at the high temperature limit of 340°F.

Write today for 12-page IMPERVITE heat exchanger catalog.

**Falls Industries Inc.**

31909 AURORA ROAD • SOLON, OHIO

When inquiring check CP 8560 on handy form, pgs. 2-3

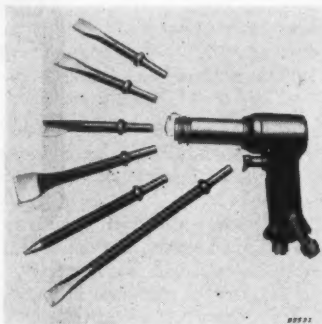
## MAINTENANCE

**No rough edges left by cutter of metal, bolts, rivets . . .**

compressed air powers unit

**Uses:** For sheet metal cutting, "goo" scraping, bolt and nut cutting, rivet cutting and punching, and spot weld busting.

**Features:** Cutter does not stretch metal and leaves no rough edges, which eliminates need for grinding in many cases. As no flame or heat



Cutter has trigger control and built in power regulator

is necessary, adjacent finishes are left unharmed. Time is saved since flammable material near working area need not be removed for safety purposes.

**Description:** MC-12 Impacutter weighs 3 lb, 13 oz, and measures 7 1/2" overall. Chisel is free to rotate and cuts in any position with relation to handle. A built-in power regulator permits complete power control, from full power blows to light taps. Chisels can be quickly changed. Wire retainer eliminates danger of flying chisels to operator.

Barrel, piston and valve box are made of heat-treated or case-hardened steel. Neoprene rubber throttle valve face requires no lapping and seals tightly under all conditions. Valve has been designed to give graduated power control over entire range of operation.

(Metal cutter is a product of Ingersoll-Rand Company, Department CP, 11 Broadway, New York 4, New York . . . or for more information concerning manufacturer's product, reader may simply check CP 8561 on the convenient Reader Service slip which is located between pages two and three.)

**J. E. SIRRINE CO.**  
GREENVILLE • SOUTH CAROLINA

*Engineers*  
ESTABLISHED 1902



PLANT DESIGN & SURVEYS • CHEMICAL • ELECTROCHEMICAL •  
METALLURGICAL PRODUCTION • TRADE WASTE DISPOSAL •  
WATER SUPPLY & TREATMENT • ANALYSES & REPORTS

When inquiring check CP 8562 on handy form, pgs. 2-3

## Aurora Vertical Sump Pumps are "TOPS"

HEAVY DUTY  
and LIGHT DUTY

ALSO NON-CLOG  
SIZES UP TO 8"

**PUMPS**  
"by  
Aurora"

For all sump drainage; liquids handling in industry; transfer of chemical and hot liquids; handling viscous or high temperature liquids; boiler blow-off; heating returns etc.; also for handling screened and unscreened sewage and industrial waste.

Write for  
**BULLETIN 104**  
(Heavy Duty & Non Clog)  
**BULLETIN 103**  
(Light Duty)

**Write TODAY**  
for  
**CONDENSED CATALOG "M"**

DISTRIBUTORS IN PRINCIPAL CITIES

**AURORA**  
PUMP COMPANY  
DIVISION OF THE NEW YORK AIR BRAKE COMPANY  
62 LOUCKS STREET, AURORA, ILLINOIS

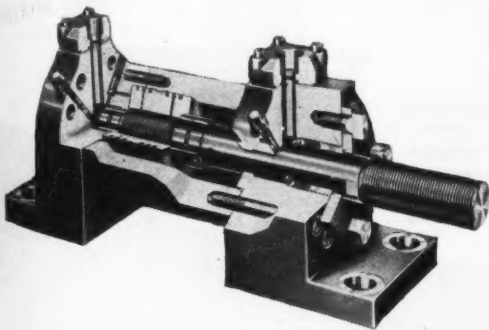
When inquiring check CP 8563 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Line of hydraulic cylinders  
includes 800 basic models  
plus combinations**

Line of hydraulic cylinders with over 800 basic models has recently been announced by manufacturer. Standard mountings available include foot, side lug, centerline, clevis, base, flange, rabbet, trunnion and sub-plate mountings.

Features of cylinder line are said to include heavy-duty construction with generous safety factors, spring-loaded piston rod packings for positive sealing, and mounting design making them interchangeable for reuse of equipment. End covers are solid steel, accurately machined for alignment of piston and rod.



Cutaway of cylinder for 3000 psi oil hydraulic service

Cylinders are available with male or female, single or double end piston rods, with or without cushion. In the 2000 and 3000 Series cylinders there is a choice of standard or 2:1 piston rods. In addition to standard piston rods, which are of ground and polished steel, optional rods are available — chrome-plated, hardened, or hardened and chrome-plated.

Bore sizes in standard cylinder line range from 1½ to 12". Company is also equipped to build cylinders of larger sizes, collapsible or telescoping cylinders, and cylinders for water service.

Model 300 Series line is designed for 150 psi air or 300 psi oil hydraulic service. The 2000 Series and 3000 Series cylinders are designed and built for 2000 psi and 3000 psi oil hydraulic service.

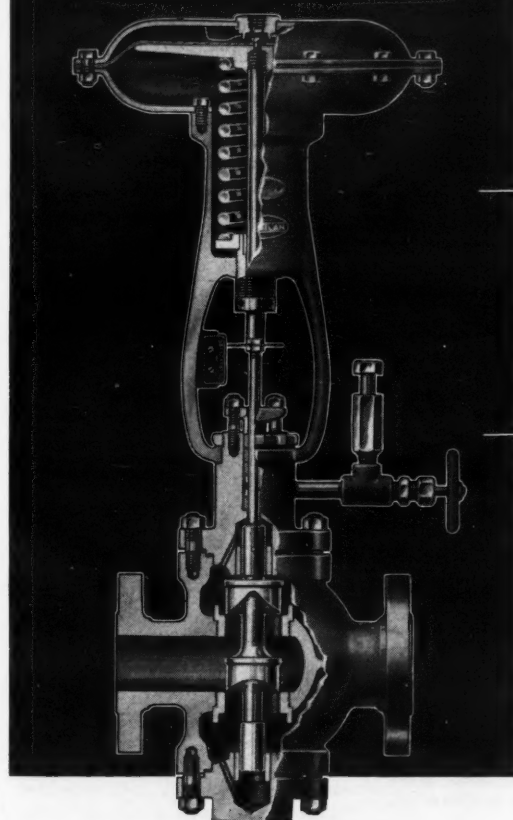
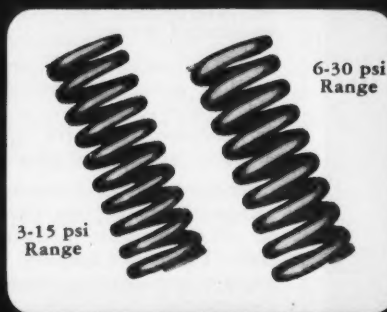
(Hydraulic cylinders are a product of Hydraulic Power Division, The Hydraulic Press Mfg. Co., Dept. CP, Mount Gilead, Ohio . . . or for more information check CP 8564, pages 2 and 3.)

**Lists advantages of multi-purpose,  
high-pressure lubricant**

Lithium-base lubricant, particularly suitable for use in highly-loaded ball and roller bearings and on heavily-loaded sliding friction surfaces, is described in two-page bulletin.

Bul 101 is issued by The Alpha Corp., Dept. CP, 179 Hamilton Ave., Greenwich, Conn. When inquiring specify CP 8565, pages 2 and 3.

# 6-30 PSI SPRING RANGE



Sales Offices or Distributors in the Following Cities: New York • Syracuse • Chicago • St. Louis • Tulsa • Philadelphia • Houston • Pittsburgh • Atlanta • Cleveland • Cincinnati • Detroit • San Francisco • Boise • Louisville • Salt Lake City • El Paso • Albuquerque • Odessa • Charlotte • Los Angeles • Corpus Christi • Denver • Appleton • Birmingham • New Orleans • Dallas • Seattle • Mason-Neilan Regulator Co., Ltd., Montreal and Toronto

## For Extra Power

Doubles the power to operate the valve when conditions make it desirable or necessary.

Makes initial spring force up to 4000 pounds available for large air-to-open single seated valves operating at high inlet pressures.

Provides large operating force at beginning of stroke.

## But No Extra Bulk

Compact, because diaphragm motor with, for example, 200 sq. in. effective area becomes equivalent to 3-15 psi motor with 400 sq. in. effective area.

## And No Extra Cost

Both 3-15 and 6-30 psi spring ranges are "standard" — there is no extra charge for the higher range.

NOTE: There is a nominal extra for oversized motors which give you even greater power where necessary.

## Operating Air is No Problem

### because

Masoneilan Pneumatic Controllers are available with 6-30 psi (as well as 3-15 psi) output at no extra cost.

Masoneilan Positioners are available with either 3-15 or 6-30 psi input and/or output at no extra cost.

Masoneilan Boosters (1 to 2 input-to-output ratio) may be used with 3-15 psi output instruments without positioner.

More details on the uses of this versatile spring range sent on request.

## ... in Masoneilan Control Valves

**MASON-NEILAN REGULATOR CO.**  
1203 ADAMS STREET, BOSTON 24, MASS., U. S. A.

When inquiring check CP 8566 on handy form, pgs. 2-3



"SMALL SIZE...  
BIG RESULTS!"



Keep condenser, heat exchanger  
and other small tubes free from  
scale or sludge and at peak  
efficiency with

## AIRETOOL MIGHTY MIDGETS

### AIRETOOL CONDENSER TUBE CLEANERS



Every type of heat exchanger and condenser tube, even those completely plugged, can be quickly cleaned by powerful Airetool outside mounted air-driven cleaners. Geared or direct-drive—positive handle control valve; drill is cooled by positive flushing system... sound deadening muffler.

Get full information on Airetool equipment for your own industrial needs. Write The Airetool Mfg. Co., 331 S. Center St., Springfield, Ohio.

BRANCH OFFICES: New York • Philadelphia • Chicago • Houston • Tulsa • Baton Rouge

Representatives in all principal cities of U.S.A., Canada, Mexico, South America and England.

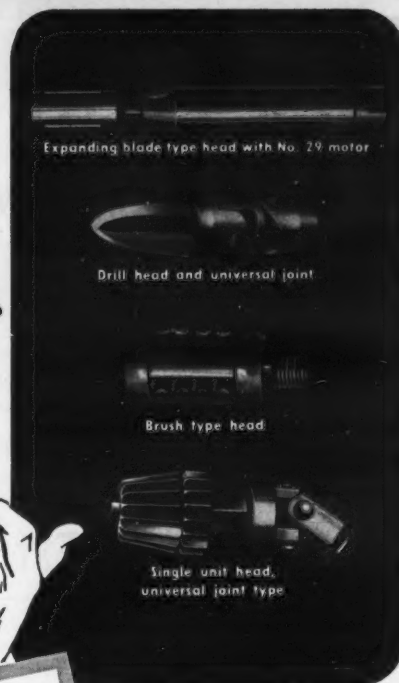
**AIRETOOL**

MANUFACTURING COMPANY

SPRINGFIELD, OHIO

There's An Airetool Tube Cleaner and Tube Expander for Every Type of Tubular Construction.

When inquiring check CP 8567 on handy form, pgs. 2-3



Airetool small tube cleaners are designed to make it easier to thoroughly remove hard or soft foreign deposits of any type from condensers, heat exchangers, or other small diameter tubular equipment; quickly and with maximum safety to inside tube surfaces.

Used with either flexible drive or a universal joint, and powered by husky air-driven Airetool motors, these small cleaner heads quickly remove foreign deposits from straight or bent tubes of 3/8" to 2" I.D.

### MAINTENANCE

**Gives operator complete and safe control of air line...**

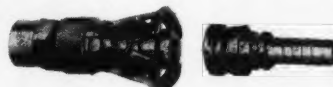
coupling cannot be disconnected when sleeve is "On"

**Uses:** For use on air lines at any point between compressor and air-operated device.

**Features:** Quick-As-Wink valve coupling assures tight swivel seal, locked safety connection, and easy disconnection. It gives operator complete, safe control of air line.

After jaws are closed around connection half of coupling, sleeve can be advanced under overhand of jaws. This locks jaws in closed position and coupling cannot be disconnected.

Returning sleeve "Off and Exhaust" position traps supply air in sliding sleeve stopping its flow. It also opens exhaust ports and permits jaws to be opened so coupling can be disconnected. A 90° twist of brass sleeve, when it is in this position, locks it and permits hose to be moved around without danger of accidentally opening valve.



**Description:** As shown in illustration, nose piece of jaw half of coupling is provided with an O-ring held in machined groove. When coupling is connected, nose piece slides into recess of connection half of coupling. Joint is tightly sealed by internal fluid pressure acting on O-ring, but two halves are able to swivel freely without leakage. O-ring is readily accessible and can be replaced easily and quickly without tools or disassembly of coupling.

Jaw or valve half of coupling which is always connected to live air supply line, is also provided with locking jaws and brass sleeve. Sleeve can be moved back and forth over hollow, radially ported stainless steel body, and is fitted on inside with pressure sealing U-packers.

(Valve coupling is a product of C. B. Hunt & Son, Inc., Dept. CP, 2200 E. Pershing Ave., Salem, Ohio... check CP 8568 on handy form, pages 2 and 3.)

# Model TA has *What it Takes* to do **TOUGH** mixing

DESIGNED FOR

EXTRA HEAVY MIXING



AGITATOR  
PARTS  
QUICKLY  
REMOVABLE  
FOR EASY  
CLEANING

**GROEN**  
STAINLESS STEEL  
STEAM JACKETED  
TWIN-SHAFT  
MIXER KETTLE

## IT'S A RUGGED, SANITARY UNIT

- Stainless steel from top to bottom. Completely sanitary—conforms to the most rigid Health Dept. requirements. Twin shaft operation for highest efficiency in mixing. Fully enclosed motor drives two shafts: (1)—at slow speed operating Flexible Finger-Like scrapers; and (2)—a secondary high-speed shaft equipped with any of a variety of beaters, blenders or mixers.

- Demountable shaft couplings permit entire agitator assembly to be removed in a few seconds for easy cleaning, and as quickly reinstalled. Cannot disengage in operation. And couplings equal strength of a solid shaft. Read all about this widely famous mixer in Bulletin TAK-2. Write for it now.

ASK US ABOUT  
THE HIGH SPEED  
ROTA-THERM  
JACKET

Attains fastest cooking speed ever produced by any kettle! Multiple steam inlet design develops high velocity steam circulation instantly. No air pockets... no cool areas, possible. Gives all advantages of stainless steel plus swiftest operation. Ask for Bulletin RT-1.

**GROEN** MFG. CO.

4531 W. Armitage Ave., CHICAGO 39, ILL.  
30 CHURCH ST. NEW YORK 7  
(HALF A CENTURY OF FINE KETTLES)  
7 FRONT STREET SAN FRANCISCO

When inquiring check CP 8569 on handy form, pgs. 2-3

CHEMICAL PROCESSING

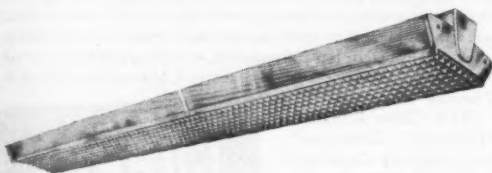
**Adaptable socket-holder bridge allows lamp change without removing fixture . . .**

lighting unit gives glare-free illumination, is ETL certified and UL approved

**Uses:** For use in any commercial application.

**Features:** Adaptable socket-holder bridge of unit makes it possible to change number of lamps or lamp spacing in field for intensity, to meet changing requirements — without removing fixture.

**Description:** Fixture, called the Puritan, has ribbed, frosted, prismatic glass panels which are easily removed for cleaning, while louvers are hinged from either side and can be removed without involving tools or loose parts. Ballast and wiring are easily accessible for servicing.



Unit offers many optional lamp spacing combinations

Housing channel of unit is formed of 20 gage steel, louvers of 22 gage steel. Louvers are welded at every intersection for permanent rigidity. Entire unit is furnished completely wired and packed in a carton, less lamps.

(Lighting fixture is a product of A. L. Smith Iron Co., Smithcraft Lighting Division, Dept. CP, Chelsea, Mass. . . . check CP 8570, pages 2 and 3.)

#### Plant modernization procedures outlined in brochure

Sixteen-page publication outlines a detailed step-by-step procedure to help guide company management and engineers in dealing with problems of modernizing and expanding plant facilities. Separate sections are devoted to each of four basic steps in the planning program. These include: 1) determination of production quotas; 2) an analysis of products and product components; 3) analysis of production facilities; 4) preparation of optimum layout.

Specific data that each company department must submit to top management and how this data should be evaluated to arrive at specific management decisions are indicated in each section.

By following procedure outlined in brochure, management can determine basic cost of a proposed modernization and/or expansion program.

"Basic Planning — Plant Modernization and Expansion" is issued by Walter Kidde Constructors, Inc., Dept. CP, 140 Cedar Street, New York 6, N. Y. Specify CP 8571, pages 2 and 3.

## How to Figure the cost of STEAM TRAPS

**1. PRICE**—you get a lot of trap for your money when you buy an Armstrong: big capacity in small size; the long-lasting mechanism in traps for low and medium pressures is identical in design, workmanship and materials, to that in traps for 900 degrees, 950 lbs. pressure!

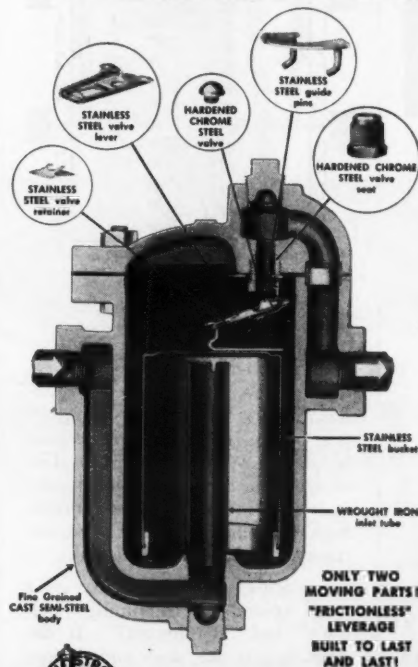
**2. INSTALLATION**—Armstrong gives you a choice of body styles to save installation labor and pipe fittings.

**3. MAINTENANCE**—Armstrong traps last longer! You save labor, parts cost and downtime. Freedom from leakage saves fuel.

Divide total trap cost by the life of the trap to get costs per year—this is where Armstrong traps really shine. Call your Armstrong Representative for the traps you need now, or write:

#### ARMSTRONG MACHINE WORKS

880 Maple Street • Three Rivers, Michigan



#### Full Facts In FREE Catalog J

Catalog J, also an educational handbook on condensate drainage, gives sizes, prices and capacities of Armstrong traps. It tells how to select traps; how to make hook-ups; how to trouble-shoot. Send for a copy today.

BOTTOM INLET—TOP OUTLET

SIDE INLET—SIDE OUTLET

RIGHT ANGLE CONNECTIONS

BUILT-IN STRAINER

#### STEAM TRAP CHECK LIST

#### ARMSTRONG TRAPS

Hardened chrome steel valve and seat?	Yes
All other parts stainless steel?	Yes
Long-lasting "frictionless" leverage?	Yes
Self-cleaning, non-clogging operation?	Yes
Choice of body styles?	Yes
Available with built-in strainers?	Yes
Available with internal check valves?	Yes
40 years inverted bucket trap experience?	Yes
Guaranteed unconditionally to satisfy?	Yes

# ARMSTRONG STEAM TRAPS

**COST LESS!**

When inquiring check CP 8572 on handy form, pgs. 2-3



# REEVES

Fractional HP Motodrive

**NEW!**



45° MODEL



HORIZONTAL MODEL

## NEWEST DESIGN FOR VARIABLE SPEED

### 112 ASSEMBLIES

to choose from—  
engineered to your exact requirements!

#### CHECK ALL THESE NEW, REEVES FEATURES

- 1 New redesigned, more compact drive gives you speeds from 3 to 4660 RPM . . . speed ranges from 10 to 1!
- 2 New "all-position," 14-turn handwheel gives operator sensitive, minutely-accurate speed control from a position most convenient for the installation!
- 3 New "all-position" output shaft permits driving in any direction—horizontal or vertical down!
- 4 New spiral groove lubrication with exclusive overflow outlet provides complete lubrication of all sliding surfaces for trouble-free operation at all times!

REEVES PULLEY COMPANY • COLUMBUS, INDIANA

Send Today for Complete Information!  
Specify Bulletin CP7-M543.



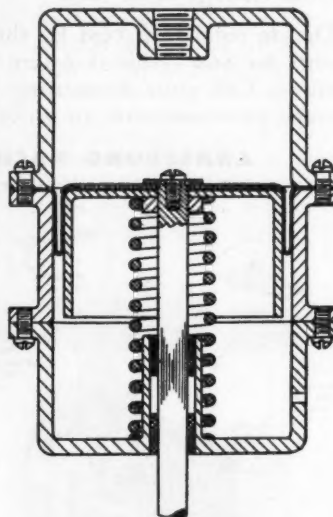
When inquiring check CP 8573 on handy form, pgs. 2-3

## MAINTENANCE

**Precise frictionless power offered by non-sliding piston seal . . .**

operates at pressures to 500 psig over wide temp range

**Uses:** Application of seals falls into three separate classifications: 1) instruments — for repeatedly converting pressure (gas or liquid) into a corresponding force or displacement with precise accuracy; 2) power actuators and motors — for converting pressure into a long stroke at high thrust levels without mechanical friction; 3) seals — to prevent leakage of gas or liquid across a moving piston or shaft without introducing mechanical friction or spring gradient.

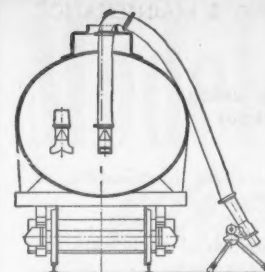


Frictionless feature of seal is shown in schematic

**Features:** Because no sliding action occurs, the device isn't seriously affected by foreign matter. Use of synthetic fabrics and elastomeric materials in construction permits high working pressures. Service constitutes replacement of seal.

**Description:** Bellofram is a word coined by combining "bellows" and "diaphragm." It denotes long stroke, deep convolution, constant area diaphragms with increased flexing life and low spring gradient. Seals are frictionless, free positioning, and relaxed at all points within their stroke.

(Piston seals are a product of Bellofram Corp., Dept. CP, 144 Moody St., Waltham, Mass. . . . check CP 8574, pages 2 and 3.)



TANK CAR is easily freed of fumes for workers' safety.

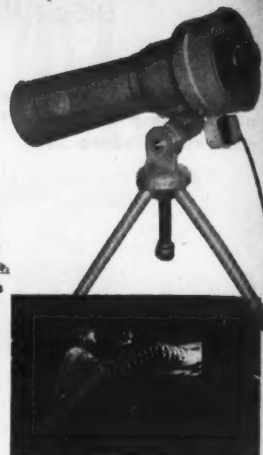
## KEEP AIR FRESH

in confined places  
with COPPUS

### Design "A" Ventilator

Improve workers' safety—health—comfort—efficiency. Get rid of dangerous gases, fumes, stagnant air. Coppus Design "A" Ventilator ventilates tanks, tank cars, drums, vats, underground cable manholes, pipe galleries, airplane wing compartments, fuselages. For complete information, write Coppus Engineering Corporation, 385 Park Ave., Worcester 2, Mass. Sales Offices in Thomas' Register.

Other "Blue Ribbon" Products in Chemical Engineering Catalog, Refinery Catalog, Best's Safety Directory and Mining Catalogs.



CHEMICAL STILL is here ventilated while being repaired.



When inquiring check CP 8575 on handy form, pgs. 2-3

## BRIEFS...

from contemporary  
publications

READ THEM . . . IN THIS ISSUE

You get a "quick look" at the most valuable articles being published in this field, and kindred fields . . . by reading the "BRIEFS" section of CHEMICAL PROCESSING every month.

Our Editors read more than 50 contemporary publications every month . . . select those articles they believe you will want to know about . . . and, in terse style, they tell you about them. Name of publication and issue are given so you can read those you want to know more about.

It's a monthly service . . . to save you time . . . yet keep you informed. See "BRIEFS" in this issue, page 112.

CHEMICAL PROCESSING

## MAINTENANCE

**Easy installation saves time and labor with tube fittings . . .**

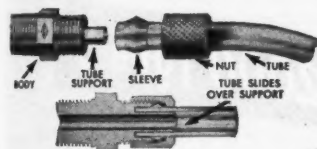
sizes now available are  $\frac{1}{4}$  and  $\frac{3}{8}$ " OD

**Uses:** For connecting polyethylene and other plastic tubing.

**Features:** Ease and speed of installation are reported, as fitting need only be finger tightened and tubing can readily be bent by hand. Savings thus result in time and labor when making installations.

**Description:** Poly-Flo fittings are of compression type and consist of a brass body with integral tube support, brass nut, and polyethylene sleeve. Fittings can also be supplied in stainless steel for use with Teflon or other tubing. Integral tube support in fitting holds tubing in sealing area, permitting sleeve to grip it securely.

Fittings are offered in two sizes,  $\frac{1}{4}$  and  $\frac{3}{8}$ " OD. Styles furnished include unions, half unions, elbows, tees, and bulkhead unions. There are also unions for connecting to metal tubing.



Fitting need only be finger tightened

Joints will hold burst pressures of 0.040 or 0.062" polyethylene tubing. They are recommended for working pressures up to 125 psi in  $\frac{1}{4}$ " OD size and 100 psi in  $\frac{3}{8}$ " OD size — and for temperatures from  $-90^{\circ}$  to  $175^{\circ}$ F. Higher pressure and temperature limits apply when Teflon tubing is used.

(Plastic tube fittings are a product of The Imperial Brass Mfg. Co., Dept. CP, 1200 W. Harrison St., Chicago 7, Ill. . . . or for more information concerning manufacturer's product, reader may simply check CP 8576 on handy form which is located between pages 2 and 3.)

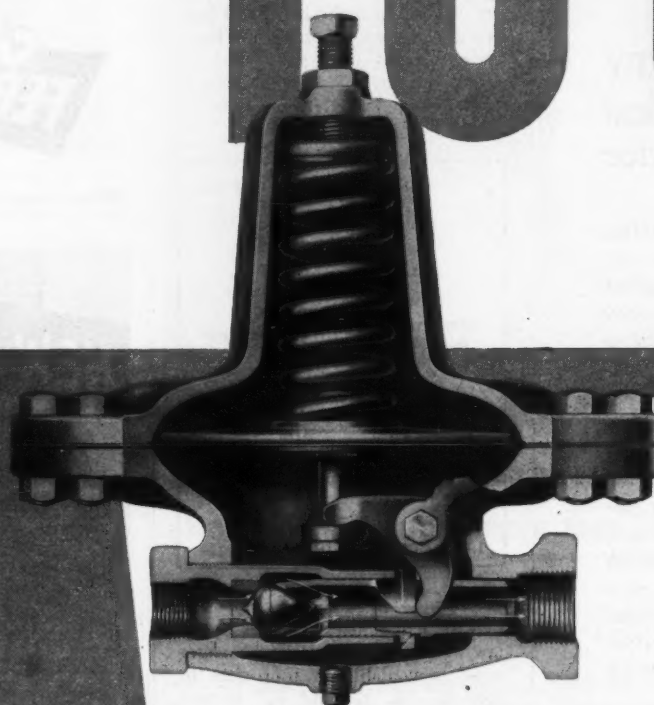
For more information on product at right, specify CP 8577 . . . see information request blank between pages 2 - 3.



# TYPE

# 1000

# VALVE



Any product of quality should be dependable when ordinary products fail. Sudden pressure fluctuations, dirt, scale and viscous matter prove "fatal" to ordinary pressure reducing valves.

The CASH STANDARD TYPE 1000 VALVE however, is designed to operate with complete dependability under the

most difficult and unusual circumstances. Many of these units have been in service over 10 years and have never been taken "out of the line."

Truly an EXTRAORDINARY achievement of quality and design excellence.



## INSTALL CASH STANDARD "TYPE 1000" VALVES

## CASH STANDARD

## A. W. CASH COMPANY

## DECATUR, ILLINOIS





**DURCO**

DURCO Type J2 Y Valve

DURCO Type K2 Y Valve

is for **VARIETY**  
in chemical  
service

Extremely versatile, these valves are in corrosion service throughout the chemical industry where tight shut-off is required. Type J2 features renewable disc ring and Teflon® -to-alloy seating. Type K2 is similar in design with renewable seat ring for extended life. Design permits varied combination of materials and easy conversion to 90 degree angle valve by rotation of body halves. Write for bulletin V/7.



THE DURIRON COMPANY, Inc., Dept. CP, Dayton, Ohio

Please send Bulletin V/7.

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

When inquiring check CP 8578 on handy form, pgs. 2-3

## MAINTENANCE

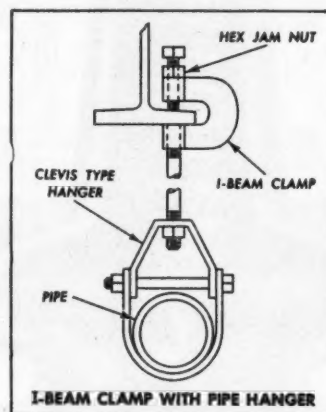
**Piping system erection, maintenance simplified by I-beam clamp . . .**

unit is vibration-resistant and adjustable

**Uses:** Clamp is designed to handle requirements in process food and chemical, utilities, and steam piping systems.

**Features:** I-Beam pipe hanger clamp, used in conjunction with manufacturer's 2-section split-ring clevis-type pipe hangers, is said to afford easy erection of all piping systems, simplifying maintenance or layout changes.

**Description:** Clamps are adjustable to various thicknesses of beams by means of a hardened set screw which clamps to beam. A hex jam nut is used to lock clamp and bolt firmly to resist vibration. Clamp body, formed of 9-gage steel, is 2 3/8" long by 2 3/8" wide with a 3/4" opening, which receives a va-



riety of flange sizes. Lower clamp jaw, threaded to receive hanger rods, is available in four sizes to take 3/8, 1/2, 5/8, and 3/4" hanger rods.

Clamps are made of 1040 high carbon steel, providing fatigue-resistant characteristics for trouble-free service.

(I-Beam clamps are a product of The Globe Stamping Division, Hupp Corporation, Department CP, 1250 West 76th Street, Cleveland 2, Ohio . . . or for more information concerning manufacturer's product, reader may simply check CP 8579 on the convenient Reader Service slip which is located between pages two and three.)

## NEW Ejectopump

COMPRESSED AIR OPERATED

**for ABRASIVE and INFLAMMABLE LIQUIDS and SEMISOLIDS**

Requires no lubrication

**NO GLANDS**

**NO BEARINGS**

**NO MOVING PARTS**

Now available for the first time in the U. S. Especially suitable for handling latex, bitumen, paint, chocolate, fruits and vegetables suspended in water, pottery slip, carborundum slurries, and various chemicals. Will not cause aeration or coagulation of materials. Available in 1 1/2", 2", 3", 4" and 6" sizes.

Write today for complete details.

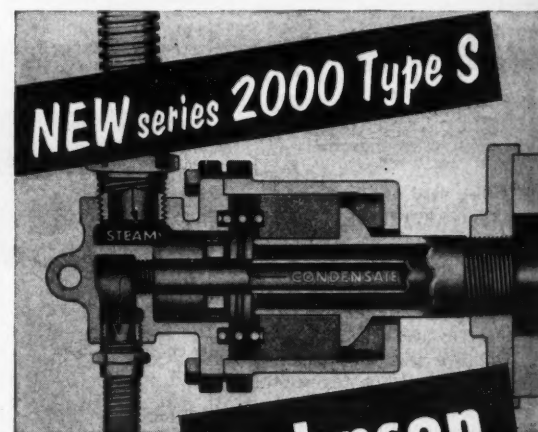


**FERRO CORPORATION**

*Supplies Division*

4184 EAST 56th STREET • CLEVELAND 5, OHIO

When inquiring check CP 8580 on handy form, pgs. 2-3



**Johnson**  
**Self Supporting**  
**Joints**

Now Smaller Size  
• Lighter Weight  
• Lower Cost  
• Longer Life

WRITE FOR NEW CATALOG



THE JOHNSON CORP., 826 WOOD ST., THREE RIVERS, MICH.

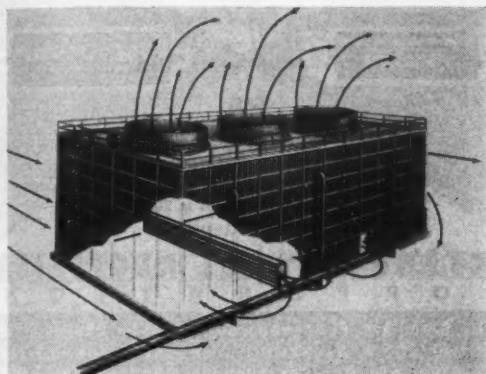
When inquiring check CP 8581 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Design of cooling tower balances pressure and reduces unwanted recirculation . . .**

equalizing channels relieve pressure differential existing on windward and leeward sides

Progress toward control of recirculation in cooling towers has been announced by manufacturer. Engineering and design of recently introduced tower, using equalizing channels between each cell of tower, balances pressure and reduces recirculation.



Flow diagram indicates how pressure balance is achieved around cooling tower

In operation, to prevent exhausted air from being forced downward into inlet area and recirculated through tower, equalizing channels have been introduced into large, multi-cell towers which relieve pressure differential existing between windward and leeward sides. Pressure is thereby equalized on both sides of tower, and during presence of strong horizontal winds, channels allow air to pass completely through tower.

Degree of recirculation always determines tower's performance. This factor cannot be accurately predicted in advance of actual operation. Recirculation will vary with every type of cooling tower installation. Manufacturer does report, however, that location or obstructions in vicinity of tower will not impede its performance.

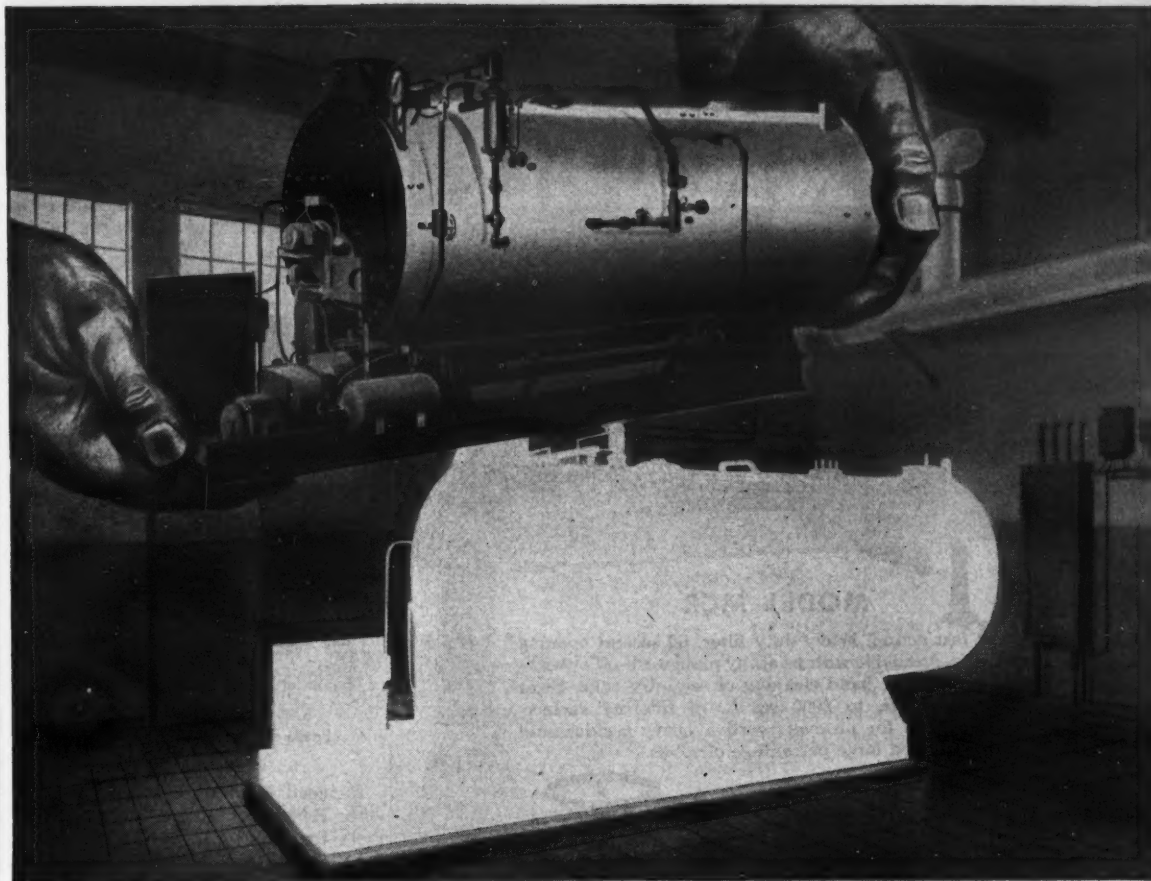
(Cooling towers are a product of Sante Fe Tank & Tower Co., Dept. CP, 5401 So. Boyle Ave., Los Angeles 58, Calif. . . . check CP 8582, pages 2 & 3.)

**Illustrates adjustable V-belts**

Adjustable V-belts for D and E belted drives are illustrated in 8-page catalog. Design data is discussed, and explanation of installation and operation characteristics is included. Tables show correct lengths for adjustable V-belts.

"Veelos TD and TE V-belts" is available from Manheim Manufacturing & Belting Co., Dept. CP, 13 Stiegel St., Manheim, Pa. When inquiring specify CP 8583 on handy form, pages 2 and 3.

# Here's why you get more...when you buy a Cleaver-Brooks Self-Contained Boiler



**...only Cleaver-Brooks can offer you the experience gained from more than 20 years of pioneering . . . and more than 12,000 individual "packaged" boiler installations**

**C**LEAVER-BROOKS pioneering has been largely responsible for simplifying boiler buying . . . lowering costs of installation . . . delivering 80% guaranteed steam efficiency from every fuel dollar when firing with oil.

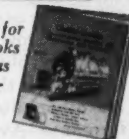
Boilers can be shipped as completely assembled and tested self-contained units, with auxiliaries as required. Installation involves minimum of time, construction and space. Usually connections only to steam, fuel, water lines and electrical service are needed. No special foundations are required. A short vent takes care of exhaust gases. Frequently, boilers are ready for use in a matter of hours, depending

on availability of service lines.

Cleaver-Brooks, originators of the self-contained boiler, offers wider experience that counts in another important way. Qualified engineers help you plan steam plants tailored exactly for your needs. Carefully analyzed are loads, space and equipment arrangement. This not only helps you solve present steam needs, but adds flexibility for future expansion as well.

This application engineering, plus basically sound design and construction is your assurance of a full return from your boiler investment. When you specify a self-contained boiler — make sure it's a Cleaver-Brooks.

Send for Catalog AD-100 for full details on Cleaver-Brooks boilers. Available for oil, gas and combination oil/gas firing. Sizes 15 to 500 hp, 15 to 250 psi — for heating and processing.



**CLEAVER-BROOKS COMPANY**  
Dept. F-348 E. Keefe Ave.  
Milwaukee 12, Wisconsin, U.S.A.

**Cleaver-Brooks**

ORIGINATORS OF  
THE SELF-CONTAINED BOILER

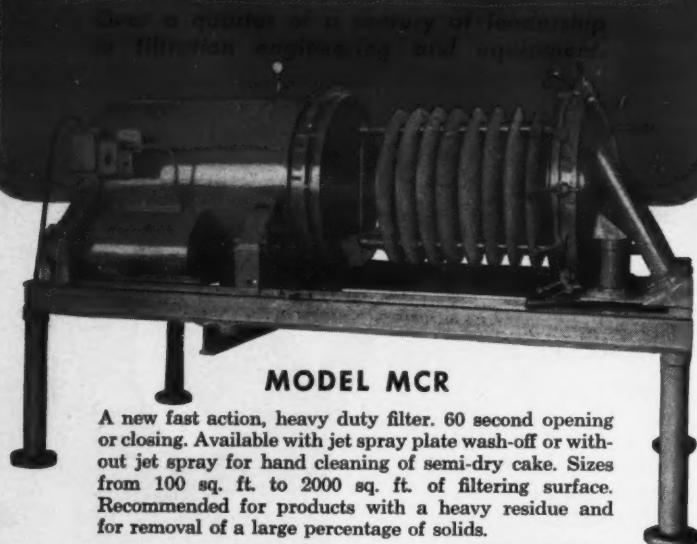


Steam Boilers • Oil and Bitumin Tank  
Car Heaters • Distillation Equipment  
Oil and Gas Fired Conversion Burners

When inquiring check CP 8584 on handy form, pgs. 2-3



# FOR BOTH— HEAVY SOLIDS and FINE FILTRATION call on **SPARKLER**



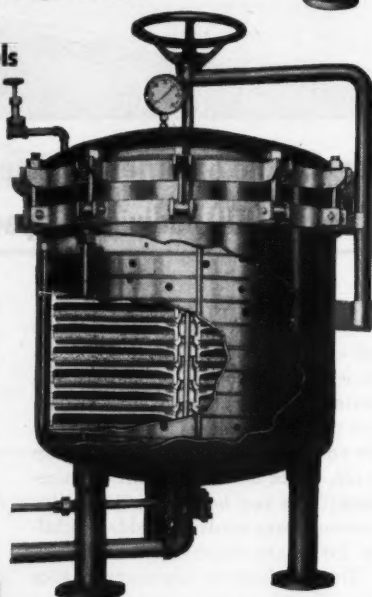
**MODEL MCR**

A new fast action, heavy duty filter. 60 second opening or closing. Available with jet spray plate wash-off or without jet spray for hand cleaning of semi-dry cake. Sizes from 100 sq. ft. to 2000 sq. ft. of filtering surface. Recommended for products with a heavy residue and for removal of a large percentage of solids.

## Standard Horizontal Plate Models

For many years the accepted standard for fine filtering. Positive cake stability, no slipping or cracking, under any pressure variation or with complete shut-down of filtering, is an exclusive feature of the Sparkler horizontal plate filter that has earned a wide acceptance and use of this filter. Filter aids can be floated on the plate evenly at low pressure and fine sharp filtration obtained, right from the start with a thin low density pre-coat. No other filter can match this performance. Available in plate capacities up to 150 sq. ft. of filtering surface. Tanks and plates available in a wide range of metals including Hastelloy, stainless steel, etc.

Write Mr. Eric Anderson for personal service on your filtering requirements.



**MUNDELEIN, ILL.**

Service representatives in principal cities: • Sparkler Western Hemisphere Corp., Mundelein, Ill., U.S.A. • Sparkler International Ltd., Prinsengracht 876, Amsterdam, Holland • Kamitter & Co., 35 Chittaranjan Ave., Calcutta 12, India.

When inquiring check CP 8585 on handy form, pgs. 2-3

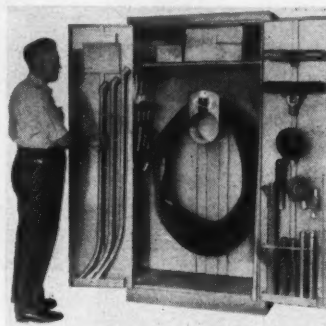
## MAINTENANCE

### Vacuum cleaning hose and tools stored conveniently

**Uses:** For accessories' storage by users of industrial vacuum cleaning equipment.

**Features:** This hose and tool cabinet can be centrally located, and is completely equipped for utility and convenience. Cleaning nozzles, tools, and hose can be easily replaced when not in use.

**Description:** Cabinet is 18" deep, 40" wide, and 78" high. It is made of heavy 18 gage welded steel with additional reinforcing.



Features immediate accessibility

Included are: a 12 by 14" shelf for replacement items, wall brackets for 100 ft of 1 1/2" hose and 33 miscellaneous tools, hooks on the inside for smaller accessories, and additional hooks and brackets for larger tools and rods placed inside the doors.

(Storage cabinet is a product of Air Appliance Div., U.S. Hoffman Machinery Corp., Dept. CP, 105 Fourth Ave., New York, N. Y. . . . check CP 8586, pages 2 and 3.

### Supply sources for metal stampings listed

Directory has been compiled to assist purchasers of metal stampings in locating competent and helpful sources of supply. Publication contains suggested terms and conditions of sale for pressed metal industry.

"1953 Blue Book of Stamping Manufacturers" is available on letterhead request to Pressed Metal Institute, Dept. CP, 2860 E. 130th St., Cleveland 20. O.

## Selenium Rectifiers

Phenolic Cartridge Type

**TYPE P** **TYPE F** **TYPE S**

**CASE DIAMETER:**  
From 1/4" to 1 1/4"  
**LENGTH:** From 1/2" to 12"  
**CURRENT, half-wave:** 1.5 ma to 60 ma  
**VOLTAGE, DC output:** 20 volts to 200,000 volts  
**SEND FOR BULLETIN H-1**

### INTERNATIONAL RECTIFIER CORPORATION

1521 E. Grand Ave., El Segundo, Calif. • Phone: ORegon 8-6281  
CHICAGO: 205 W. Wacker Drive • Phone: Franklin 2-3889  
NEW YORK: 501 Madison Avenue • Phone: Plaza 5-8665

When inquiring check CP 8587 on handy form, pgs. 2-3

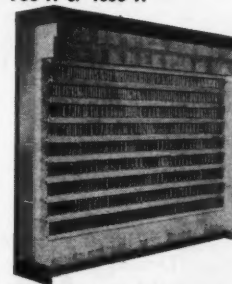
## A GUARANTEED HEAT SOURCE, Easily Installed

### "FOLDED-and-FORMED" Heating Elements

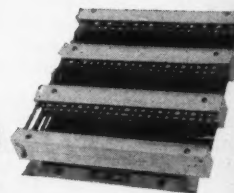
are quickly, easily installed in furnaces, ovens, kettles, etc., to assure a heat source unequalled for quick rise to temperature; long-life efficiency; low-cost maintenance and repairs.

#### STANDARD RACKS

Size 12" x 12". Installed vertically or horizontally, side-by-side, end-to-end, or in banks, to meet K. W. requirements. Five-year guarantee, at temperatures to 750°F. or 1350°F.



Hundreds of different applications are demonstrating the outstanding efficiency and economy of "F-and-F" Heating Elements. You, too, can use them profitably!



#### CUSTOMBUILT RACKS

Available in wide range of sizes and combinations, to fit any flat or curved area, to provide maximum K. W. at temperatures to 1850°F.



Electrically Heated Industrial Equipment  
235 LEVERINGTON AVE. PHILA. 27, PA.

When inquiring check CP 8588 on handy form, pgs. 2-3

CHEMICAL PROCESSING

### Valve stem life increased 20 to 30 times by alloy

Recent announcement of production of a line of 125 and 150 lb union bonnet bronze gate valves has been made by manufacturer. Valves are equipped with OIC 40 alloy valve stem material. Lab and field tests are said to have shown that this alloy lengthens valve stem life 20 to 30 times. Alloy has characteristics which give freedom from galling or seizing, and permit stems to turn smoothly and easily under severe conditions.

Other features of valve include a flexible T-type stem to wedge connection, full size ports, large stuffing boxes, one piece plastic packing ring, and ventilated die-cast handwheels.

(Valves are a product of The Ohio Injector Co., Dept. CP, 100 Ejector St., Wadsworth, Ohio . . . or for more information check CP 8589 on handy form, pages 2 and 3.)

### Lightweight, air-operated tools feature reversible motors

Manufacturer has announced a series of 24 lightweight, air-operated, reversible screw drivers and nut setters, which has been added to a line of power tools. Reversible motors permit tool's use for removing threaded fasteners as well as applying them. They also speed inspection, testing, service, and repair of all assembled products.

Tools are available in four basic speeds, ranging from 475 to 2000 rpm. Each is offered with either slip clutch (for exacting tension control) or positive clutch (manual control). A further option of lever throttle or pistol-type throttle is offered for all types. Eight additional models feature a 25% slip clutch drive, raising the total to 24 variations of the basic tools. Weight of unit is two lb.

(Reversibles are products of Thor Power Tool Co., Dept. CP, Aurora, Ill. . . or for more information check CP 8590 on handy form, pages 2 and 3.)

### Technical manual on all aspects of V-belt drives

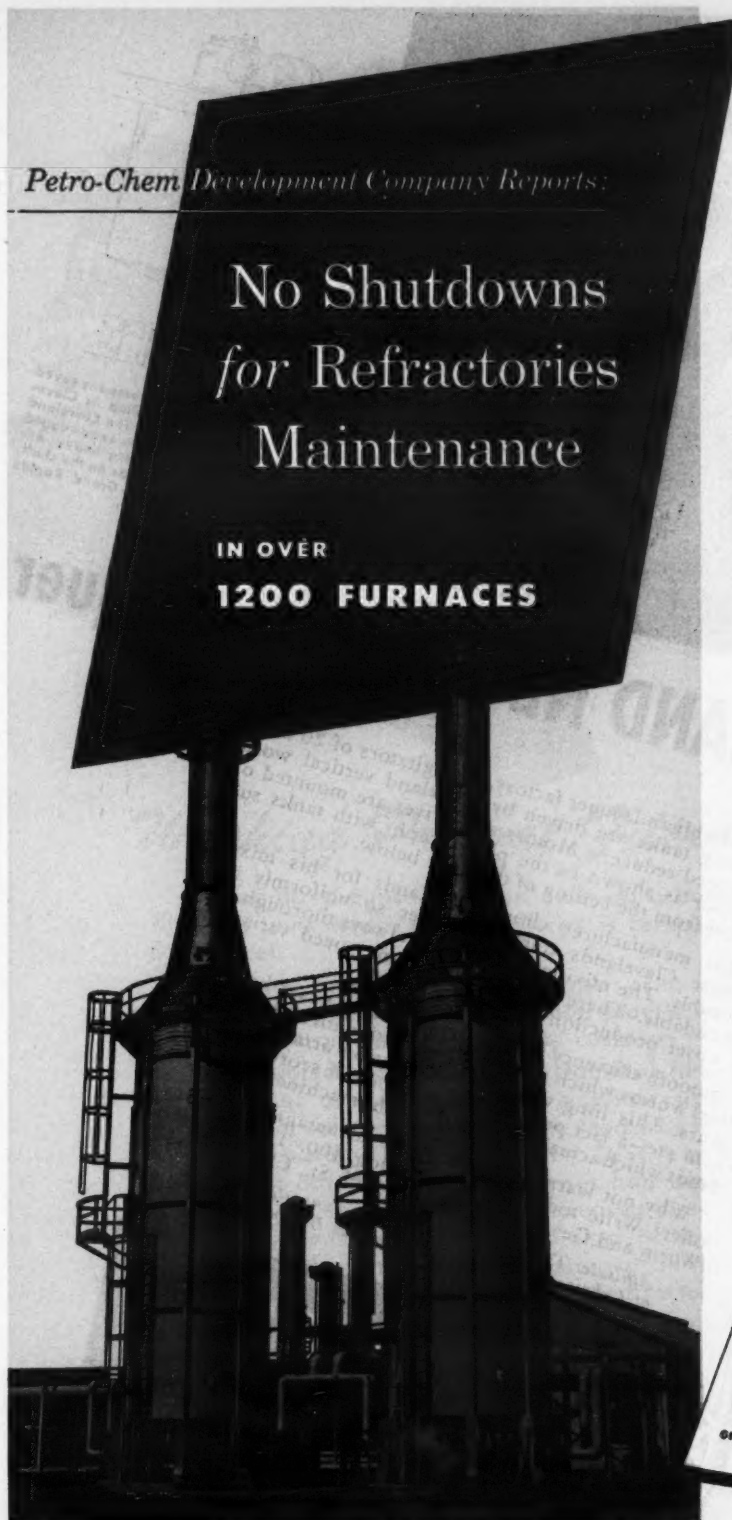
Complete with tables, graphs, and diagrams, 52-page manual covers all elements of V-belt drives. Several tables delineate the new numbering system of the V-belt industry, together with the numbering systems of major manufacturers. Manual covers such subjects as how to select a V-belt drive, easy way to select a V-flat drive, V-belt drive design sheet, non-standard drive instructions, and speed-up drives. Tables for each subject are included.

V-belt manual is available from Dept. 609-26, Boston Woven Hose & Rubber Co., Dept. CP, P. O. Box 1071, Boston 3, Massachusetts. When inquiring specify CP 8591 on handy form, pages two and three.

*Petro-Chem Development Company Reports:*

## No Shutdowns for Refractories Maintenance

IN OVER  
1200 FURNACES



In 1940, the Petro-Chem Development Company lined their first Iso-Flow furnace with B&W Insulating Firebrick. Today, over 1200 installations later, (some with fluid outlet temperatures over 1600F) not a single furnace has ever been shut down because of the need for refractory maintenance.

Long life is just one reason furnace builders, as well as furnace operators, insist on B&W IFB. Here are four more:

### CUT INSTALLATION COSTS

B&W Insulating Firebrick are easy to install. They can be cut, drilled or shaped on the job with ordinary woodworking tools. Their lightness makes them easy to handle.

### ELIMINATE EXPENSIVE ALLOYS

Because of their high insulating values, B&W Insulating Firebrick can be supported or anchored with ordinary carbon steel. Expensive, heat-resisting alloys are not necessary.

### REDUCE DOWN-TIME

These brick have low heat storage, cool off quickly. This makes possible quick access to the furnace for inspection. They heat up quickly to get back on the line, too.

### CLOSE TEMPERATURE CONTROL

Due to the low heat-storage capacity of B&W IFB, their hot-face temperature responds quickly to changes in the rate of heat input to the furnace — insuring the closest possible temperature control.

You, too, can profit by this four-way economy of B&W Insulating Firebrick. Ask your B&W representative for all the facts on these cost-cutting refractories. He'll be glad to discuss your refractory problems with you.

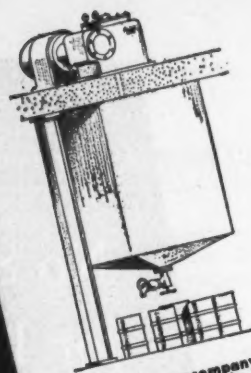


B&W REFRACTORIES PRODUCTS — B&W Allmetal Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick  
B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS — Stationary & Marine Boilers and Component Equipment...  
Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers . . . Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

R-449

When inquiring check CP 8592 on handy form, pgs. 2-3





How a large lacquer company saved space when it installed its Cleveland-driven mixers. The Cleveland ND drive is built with extra-rugged shaft bearings to take heavy, externally applied loads on the shaft. Photo courtesy of Grand Rapids Varnish Corporation.

## Twenty CLEVELAND ND units mix lacquer

In a Michigan lacquer factory, the agitators of 20 batch mixing tanks are driven by Cleveland vertical worm gear speed reducers. Motors and drives are mounted on one floor as shown in the photograph, with tanks suspended from the ceiling of the floor below.

This manufacturer chose Cleverlands for his mixers because Cleverlands transmit power so uniformly and smoothly. The mixing operation is always thorough and dependable. There are no unwelcome speed variations to upset production schedules.

Smooth efficiency stems from Cleveland's case-hardened steel worms which run in perfect mesh with nickel-bronze gears. This long-wearing combination *actually improves with use*—a fact proven by the record of scores of Cleverlands which actually have outlived the machines they drove.

Why not learn more about the advantages Cleverlands offer? Write today for free Catalog 400. The Cleveland Worm and Gear Co., 3257 East 80th St., Cleveland 4, O.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

**CLEVELAND**  
*Speed Reducers*

When inquiring check CP 8593 on handy form, pgs. 2-3

## ENGINEERING & MAINTENANCE

### Space savings, improved bearings, insulation offered through motor design . . .

drip-proof, totally-enclosed models available meet new NEMA standards

**Uses:** For a variety of uses where integral horsepower induction motors, drip-proof and totally-enclosed, are applicable.

**Features:** As a result of field and laboratory tests and investigations, each feature of entire line of motors, called Life-Line-A, has been improved. All conform to new NEMA standards calling for smaller motors per hp. Other improvements include: insulation — made more enduring through use of effective resins and varnishes; a more efficient and better protected bearing, with four-way seal and pre-lubrication; a more efficient ventilating system using straight-through design with small openings normal to shaft axis in one quadrant of periphery of end-brackets; and overall quieter operation.

**Description:** Line of motors includes drip-proof, totally-enclosed fan-cooled, and totally-enclosed non-ventilated. Units are now available in speeds of 1800 to 1200 and 900 rpm, and will be available shortly in 3600 rpm. Sizes now available are 1, 1½, and 2 hp. Manufacturer has announced availability of 3 and 5 hp units in June, 7½ to 10 hp in November, 15 to 20 hp next April, and 25 to 30 hp sizes in September, 1955.

(Electric motors are a product of Westinghouse Electric Corp., Dept. CP, 401 Liberty Ave., Box 2278, Pittsburgh 30, Pa. . . or for more information check CP 8594 on handy form, pages 2 and 3.)

### On-the-line repair of valves supplements reconditioning service in shop

Consultation service for on-the-line repair of high pressure valves has recently been announced. Instituted as an adjunct to concern's regular valve reconditioning activities, service is designed to cut outage time costs by making on-the-line repairs where conditions are favorable.

All types and sizes of worn-out valves, including cast and forged steel, stainless, nickel, Monel, and bronze, with WSP from 150 to 2500 lb, are reconditioned by company in its shop as well as in the field.

Where conditions preclude on-the-line service, concern offers pickup and delivery within 600 miles of Pittsburgh.

Reconditioning comprises complete disassembly of valves after which each part is cleaned and inspected for misalignment and wear. Rethreading of seats, manufacturing of new seat rings, remachining of flanges and hardfacing with proper materials are performed where necessary.

(Valve repair service is furnished by Universal Machine Co., Inc., Dept. CP, Ohioview Ave., Ambridge, Pa. . . or for more information check CP 8595 on handy form, pages 2 and 3.)

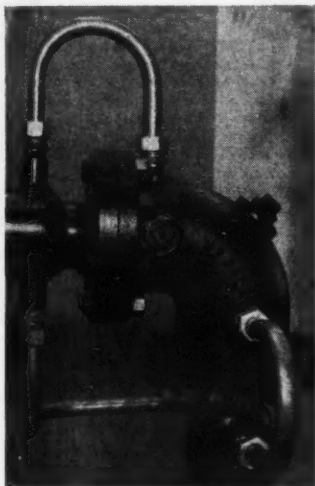
## MAINTENANCE

### **Jacketed pipe sections and fittings connected by preformed tubing**

**Uses:** For connecting jacketed pipe sections or fittings around flanged ends; to equalize pressure differentials, lessening possibility of leakage.

**Features:** Preformed steel or copper tubing eliminates need for screwed fittings and pipe in jumpovers. In addition to decreasing cost of pipe fabrications in field and reducing number of threaded joints liable to leakage, these connections can be made by unskilled labor.

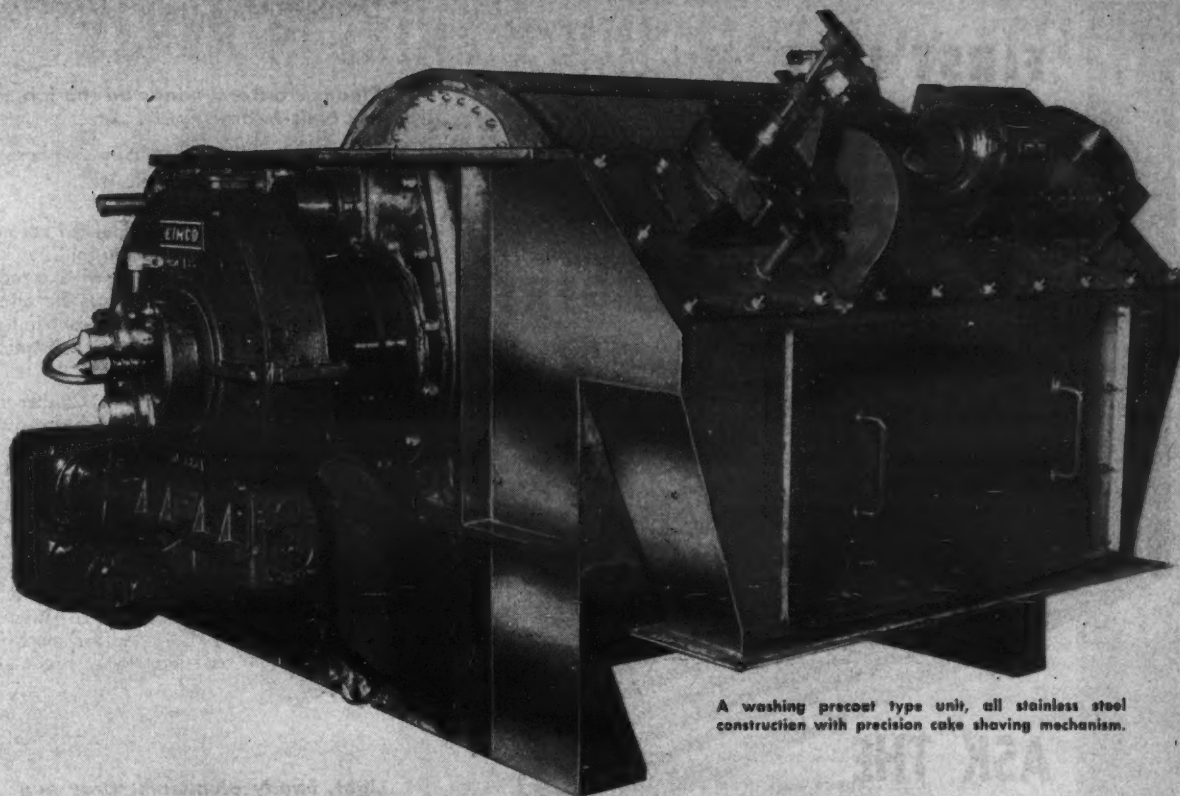
**Description:** Tubing jumpover connections are engineered to suit each individual job. Steel tubing is used when Dowtherm, hot oil, or high pressure steam is used. Aluminum or copper tubing is used for low pressure steam. Tubing fittings are furnished to suit tube materials.



Jumpover connections can be made by unskilled labor

(Tubing jumpover connections are a product of Parks-Cramer Company, Dept. CP, 444 Rose, Fitchburg, Mass. . . . or for more information reader may simply check CP 8596 on handy Reader Service slip which is located between pages two and three.)

For more information on product at right, specify CP 8597 . . . see information request blank between pages 2 - 3.



A washing precoat type unit, all stainless steel construction with precision cake shaving mechanism.

## *Washing Precoat Filtration Units*

Specialized Eimco filtration units do a better job than standard filtration units where the metallurgy is complicated and the savings are critical.

Here is another typical example of a specialized application where Eimco design and construction played an important part with a consequent greater saving to the customer.

The subject plant was using standard filter press equipment for extraction of a valuable copper sulphate solution from the slurry. A 2% copper sulphate content in the feed was filtered on a unit similar to the one pictured and reduced the  $\text{CuSO}_4$  to less than 0.5% where as the best obtainable in the presses had been between 0.6—0.7%. Flow rates on the filtrate were increased from .8 gallons/sq. ft./hr. to 4—4.5 gallons per sq. ft. per hr. on a 24 hour basis. Clarity of the filtrate from the Eimco unit was better at all times. Less wash water was used with a resultant lower dilution factor.

More than half a century of experience in serving the process industries, plus unsurpassed research and laboratory facilities make it possible for Eimco to recommend the best type of unit for your process.

Write for more information to The Eimco Corporation, Box 300, Salt Lake City, Utah.



**THE EIMCO CORPORATION**

Export Offices: Eimco Bldg., 52 South St., New York City • Salt Lake City, Utah—U.S.A.

*You can't beat an Eimco!*



## \*FIRST LINE

*Extended-Surface*

## HEAT EXCHANGERS



## ASK THE AEROFIN MAN

Specify AeroFin and you specify high efficiency, long service life and low maintenance and service costs.

Take advantage of AeroFin's unequalled experience, production facilities, and materials-testing and design research — of AeroFin's complete engineering service at the plant and in the field.

*\* AeroFin makes extended heat surface exclusively — not as a by-product, not as a side-line.*



*Throughout the Chemical Industry —*

**AeroFin units do the job Better, Faster, Cheaper**

**AEROFIN CORPORATION**

410 South Geddes St.  
Syracuse 1, N. Y.

*AeroFin is sold only by manufacturers of fan-system apparatus. List on request.*

When inquiring check CP 8598 on handy form, pgs. 2-3

## ENGINEERING & MAINTENANCE

***Cleans workers' hands on the job, has built-in antiseptic . . .***

waterless cleanser contains 2% hexachlorophene

**Uses:** As a hand cleaner.

**Features:** Product is formulated not only to clean hands while worker is on the job, but also to offer added protection for people with naturally dry or sensitive skin — and who may be allergic to excessive use of soaps or cleansers containing petroleum solvents. Product has built-in antiseptic properties (2% hexachlorophene).

**Description:** Sulpho Hand Cleaner is made of sulphonated vegetable oils which are often used in treatment of industrial dermatitis. Sulphonation converts oils into emulsifying agents that are able to remove dirt and grease from skin. Product also contains a relatively high amount of unsulphonated vegetable oil which acts as an emollient and keeps skin from becoming defatted.

(Waterless hand cleanser is a product of West Disinfecting Co., Dept. CP, 42-16 West St., Long Island City, N. Y. . . or for more information check CP 8599 on handy form, pages 2 and 3.)

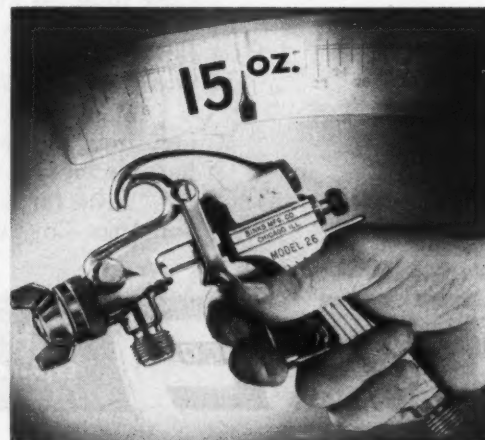
***Light, handy aluminum spray gun weighs only 15 oz. . .***

uses nozzle setups similar to those found on heavy-duty production guns

**Uses:** For spraying lacquers, synthetic enamels, paints, and other finishings and coatings of light or medium viscosity. It is recommended for intermittent or touch-up production painting, and for stencilling and blending.

**Features:** Model 26 spray gun has an aluminum body and weighs only 15 oz. Its handle and trigger are designed to fit even a small hand.

**Description:** Unit uses nozzle setups similar to those on heavy-duty production guns. It has a brass fluid passage which protects body from corrosion and erosion caused by many paints and other fluids.



## THE SHORTEST DISTANCE TO THE SOLUTION OF YOUR DUST PROBLEM



Here is the straight-line approach to facts on how to determine the solution to your dust problem. Our new manual, "A Simplified Test Method for Dust Control Determination" describes the most direct method for determining the scope of your dust problem and your dust control equipment requirements. Whether yours is a problem of recovering valuable process dust or elimination of dust that is hazardous or a nuisance — you'll profit from the time spent going over this manual.

For your copy, just clip this ad to your company letterhead and sign your name and title.

**dustex CORP.**  
1756 Walden Avenue  
Buffalo 28, N. Y.

When inquiring check CP 8600 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Air enters gun through inlet in bottom of handle. This serves to distribute weight properly and make gun's manipulation easier. Large air passages in unit reduce internal air friction. Pressure drop between air inlet and air nozzle is thereby reduced to a minimum.

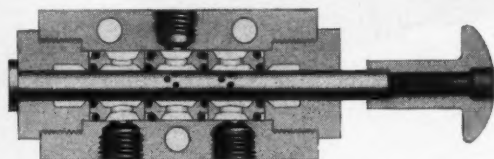
(Spray gun is a product of Binks Mfg. Co., Dept. CP, 3122 Carroll Ave., Chicago 12, Ill. . . . or for more information check CP 8601 on handy form, pages two and three.)

**Interior design simplifies valve, assures positive positioning of sealing packers**

**Uses:** For control use in air, hydraulic, or vacuum service.

**Features:** Patented interior construction simplifies valve and assures positive positioning of sealing packers without placing any mechanical pressure on packers themselves.

**Description:** Principal parts consist of a housing with straight-through bore, gland nuts for ends, a hollow radially-ported ground and polished stainless steel plunger, internal spacers held firmly in metal-to-metal end abutment, and two sizes of O-rings.



Handles pressures to 125 psi, temperatures to 150°F

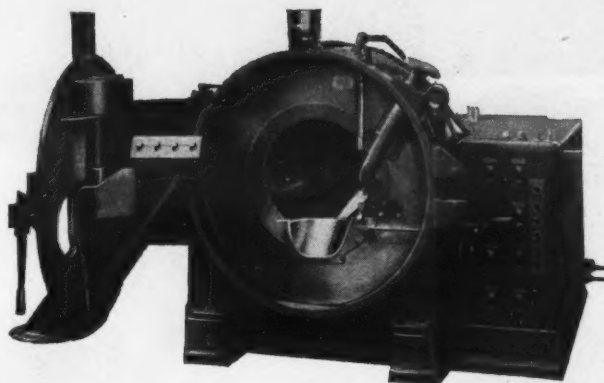
In assembly, O-rings are placed on shoulders of spacers, which are then inserted in housing. Tightening gland nuts positions spacers accurately in housing and holds O-rings in position without any mechanical pressure. O-ring packings are subjected only to fluid pressure in adjacent chambers, and are supported on both their inside and outside diameters.

According to reports, this construction minimizes friction. Wear is practically eliminated. There are no lapped joints, and no metal-to-metal seating. All parts are in pressure balance, avoiding tendency to creep or crawl. Maintenance is said to be low, and under normal conditions consists simply of occasional replacement of O-ring packings. This can be accomplished easily and quickly in the field by removal of gland nuts, usually without disturbing connecting piping.

Valves are available in push-pull, push-spring-return, hand, foot, cam, diaphragm, pilot, and single or double solenoid-operated, with 2, 3, 4, or 5-way actions and either open or closed exhaust. Units are furnished tapped for either  $\frac{1}{8}$  or  $\frac{1}{4}$ " pipe connections.

(Quick-as-Wink control valves are products of C.B. Hunt and Son, Inc., Dept. CP, Salem, Ohio . . . or for more information check CP 8602 on handy form, pages two and three.)

# BAKER PERKINS EQUIPMENT FOR EFFICIENT CENTRIFUGATION

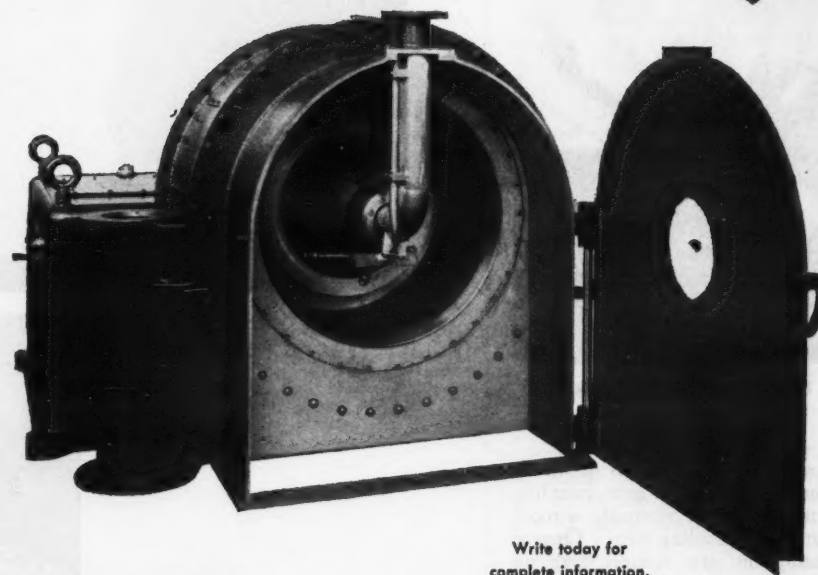


**B-P Type HS Universal Filtering Centrifugal:** Fully automatic, requires no operator attention, but can be equipped with manual controls. Simple, trouble-free cycle controller handles complicated centrifugation cycles easily—compensates for process variables. Easy change to almost any filter media keeps maintenance costs low. Constant speed drum rotation reduces power requirements. In capacities from laboratory sizes to 16,000 lbs. per hour.

**B-P Type S Continuous Centrifugal:** Continuous operation requires no timing or cycle controllers. No scrapers, baffles, rakes or plows to break down delicate crystals. Constant speed drum rotation keeps power requirements low. Rugged construction insures long service with very little maintenance. In capacities from laboratory sizes to 48,000 lbs. per hour.

**Above:** Type HS Universal Filtering Centrifugal for centrifugation of a wide range of filterable solid-liquid slurries.

**Right:** Type S Continuous Centrifugal for centrifugation of a wide range of relatively free-draining crystalline, granular and fibrous materials.



Write today for complete information.

**BAKER PERKINS INC.**  
**CHEMICAL MACHINERY DIVISION • SAGINAW, MICHIGAN**

When inquiring check CP 8603 on handy form, pgs. 2-3



## MAINTENANCE

### **Maintenance reduced with alloy steel mudline valve . . .**

"drop-tight" closures easy with simple self-aligning gate

**Uses:** For use on mud and sand carrying pipelines in the oil drilling industry.

**Features:** Alloy steel mudline valve stops sanding-up, reduces maintenance, and downtime. Simple, self-aligning steel gate which is separate from stem and its resilient Buna-N seat insert makes "drop-tight" closures easy. Mudline pressure rather than stem pressure is responsible for seal. The "open center" bonnet with a large gate opening keeps sand from collecting or packing around either gate or stem.

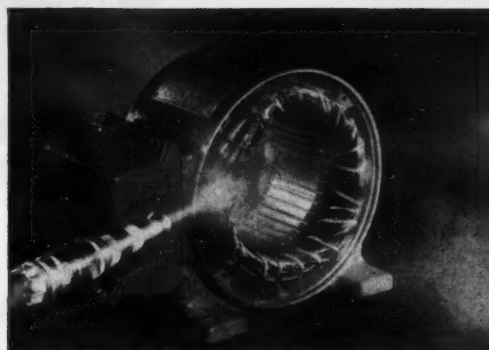
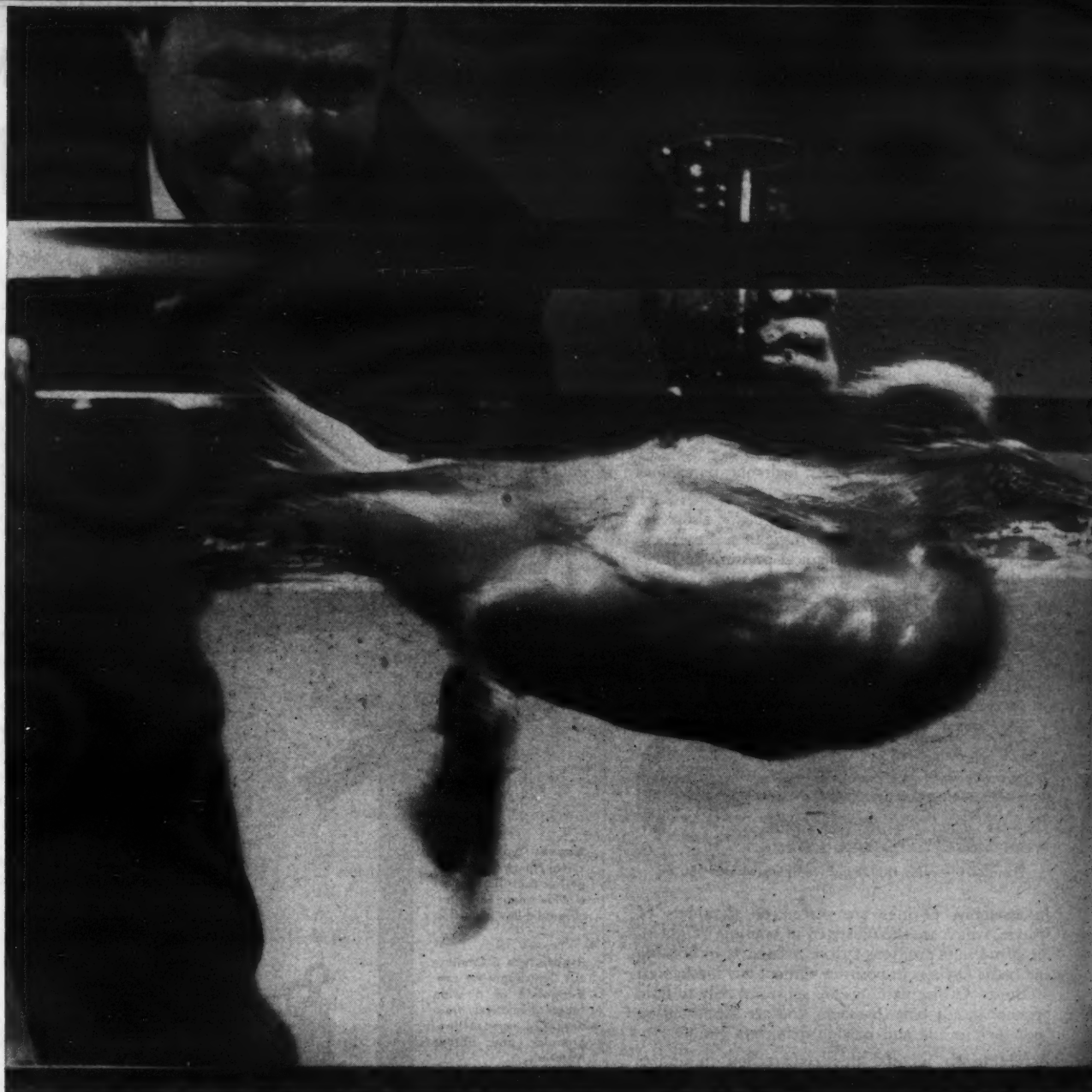
**Description:** Field maintenance of mudline valve, called the Mudwonder, is simplified by internal design. A two piece "paddle" permits use of material specifically designed for stem and for gate. Stainless steel stems last lifetime of valve. Hardened alloy steel gates, chrome plated, resist abrasive action of mud.



Field maintenance of valves is simple

Easier operation results primarily from slotted stem-gate coupling which lifts gate vertically without bending or binding stem. Chrome plating on gate reduces drag on seat insert. A double-thread construction giving a 2/1 ratio moves gate twice the usual distance with each turn of handwheel. All threads are enclosed and sealed.

Disassembly and re-assembly of



Here's a Life-Line "A" stator that has been given multiple dips and bakes of Bondite. There is no evidence of vapor penetration after being exposed to the toughest insulation test—a jet of steam.



Try tearing a piece of Life-Line's slot insulation, Mylar\*. Mechanical strength is eight times greater than ordinary slot cells. Dielectric strength is ten times greater than standard design requirements.

\*Trade Mark for Du Pont polyester film

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Forexamp  
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on the right  
insulation on th

# There's more to motor insulation than its ability to repel water

These demonstrations show how new **Life-Line A** insulating materials provide greater protection for wire, slots and complete stator.

New and improved motor insulations are the word of the day. Actually, there is a considerable range between the run-of-the-mill "improved" insulations and the really outstanding types now available. There is only one way to judge them—by comparison.

Forexample, many new stator insulations do a more effective job of shedding water. But Life-Line's® new Bondite goes a step further... it repels vapors

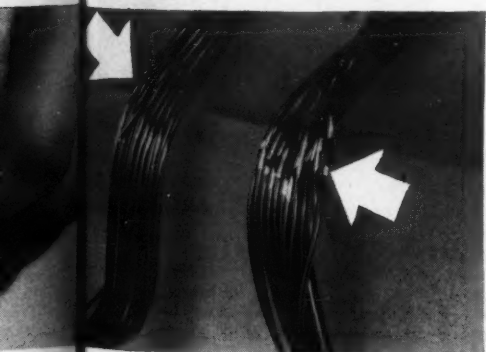
that penetrate ordinary water-shedding insulations.

The secret is in the silicone additive that is impregnated throughout Bondite instead of being just applied as a thin outer layer. The complete story of Life-Line's Bondite, Bondar and other new motor improvements is contained in the new Life-Line Booklet B-6154. For your copy, write: Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. J-21847

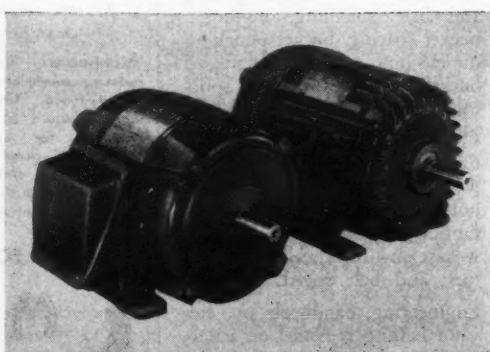
YOU CAN BE SURE...IF IT'S  
**Westinghouse**



A duck's ability to shed water is only feather deep. A simple wetting agent dissolves the duck's protective coating and he sinks. Many water-shedding motor insulations react much the same; expose them to a simple solvent and they deteriorate.



These two coils have been baked for 50 hours at 300° F. Bent around a finger, the ordinary insulation on the right coil flaked off. Life-Line's Bondar insulation on the left remained intact.



Dependable performance takes balanced design. That's why every component in the new Life-Line "A" has been redesigned and integrated with the whole. The result is a motor with superior performance.



## MAINTENANCE

valve is simple. One wrench is only tool needed.

At present, 3000 psi W. P. (6000 psi test) valves with flanged or screwed ends are being produced in 2, 3, and 4" sizes.

(Mudline valves are a product of Edward Valves Inc., Sub. of Rockwell Mfg. Co., Dept. CP, 1201 West 145th St., East Chicago, Ind. . . . or for more information check CP 8604, pages 2 and 3.)

### Pocket-size kit provides simple field test for water hardness . . .

gives sensitivity to one gr/gal and requires only a minute

**Uses:** To make simple field-check water hardness tests.

**Features:** Field tests of water hardness made with materials provided in small kit are sensitive to one gr/gal (17.1 ppm). Tests require only a minute.

**Description:** Method employed in using kit and contents — two bottles with eyedropper tops, one glass vial — represents a simplification of water test procedures based on Schwarzenbach methods.

Sample of water is measured into a marked glass vial; two drops of "Solution A" are added from a bottle, turning water red. "Solution B", from a second bottle, is then added, one drop at a time, until red color changes to blue. Each drop of "B" used represents one gr/gal of hardness, as calcium carbonate.

Speedy-Kit is pocket size — 4 7/8" long, 3" wide, 1 1/8" deep — and weighs only 6 oz. Box is made of clear plastic. A water-resistant instruction card is secured in lid. Contents include glass vial, glass bottle of solution "A" and plastic bottle of solution "B".

(Water hardness test kits are a product of Calgon, Inc., Dept. CP, 323 Fourth Ave., Pittsburgh 30, Pa. . . . or for more information check CP 8605, pages 2 and 3.)

For more information on product at left, specify CP 8606 . . . see information request blank between pages 2 - 3.



## "Buffalo" Hydraulic

### Scrubbing Tower

Cleans Air

# BETTER

**PROBLEMS:** Cleaning discharges of hot, corrosive gases, heavy and erosive dusts, or lumpy, stringy materials. Ordinary equipment becomes plugged in a short time.

**SOLUTION:** Wet centrifugal cleaning by the new "Buffalo" Hydraulic Scrubbing Tower solves above problems industry-wide. System of properly spaced Fog-type Nozzles creates a fog which jets air or gas thru unit, overcoming its own resistance. Each fog layer condenses the one below, permitting gravity travel of trapped material. This centrifugal spray action, plus scrubbing against a wetted surface, results in extremely high collection efficiency. Clogging, abrasion, corrosion and heat damage are overcome. The Scrubbing Tower is a compact, easily installed and maintained unit now handling many of the most difficult and specialized air cleaning jobs efficiently and at minimum cost.

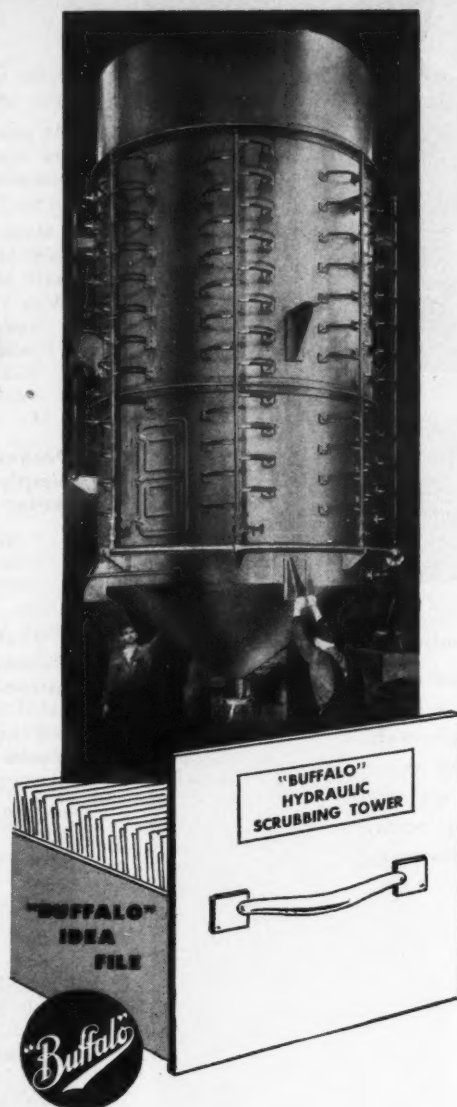
Call on "Buffalo" Know-How Backed by Thousands of Case Histories in our files from 77 years of building air handling equipment and solving air problems. Also, factory-and field-trained "Buffalo" Engineering Sales Representatives in principal cities are ready to help you.

## BUFFALO FORGE COMPANY

524 Broadway Buffalo, N. Y.  
PUBLISHERS OF "FAN ENGINEERING" HANDBOOK  
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.  
Sales Representatives in all Principal Cities

Ventilating Air Cleaning Air Tempering Induced Draft Exhausting  
Forced Draft Cooling Heating Pressure Blowing

When inquiring check CP 8607 on handy form, pgs. 2-7



## MAINTENANCE

Sealing qualities of valve improve with use through design . . .

not critical to pipe scale or other foreign material

**Uses:** For 0 to 250 psi oil service in industrial applications.

**Features:** Since solenoid valves, called Shear-Seal, are self-lapping and wear-compensating, sealing qualities improve with use.

**Description:** Valves are not critical to pipe scale or other foreign material in liquid, because lapped sealing members are in constant intimate contact. Square-corner wiping action of valve pushes dirt aside and lets it flush out through return port. No eroding or scoring occurs because flow is through the sealing members and never across the sealing surfaces.

Valves are available in 1/4, 3/8, and 1/2" pipe sizes in 4-way, 3-way, and shut-off models for 110, 220, or 440v AC.

(Solenoid Valves are a product of Barksdale Valves, Dept. CP, 5125 Alcoa Ave., Los Angeles 58, Calif. . . . or for more information check CP 8608 on the convenient Reader Service slip which is located between pages 2 and 3.)

### Data for elevator belt engineering

Engineering handbook describes and illustrates belt bucket elevators, gives factors for belt selection, outlines procedures for engineering correct belt, and describes belt construction features. Included in section devoted to installation are bucket spacing and belt punching, minimum bucket spacing, bucket punching dimensions, tables of standard buckets, methods of belt splicing, elevator belt take-up, and pulley lagging.

Convenient data tables refer to weights of materials handled, holding properties of various fabrics, determination of belt weight and thickness, drive factors, and belt speed.

Engineering handbook on elevator belting is issued on letter-head request to The B. F. Goodrich Co., Dept. CP, 448 Main St., Akron 16, Ohio.

## SMOOTH—VIBRATIONLESS PROPELLERS

for MIXING, STIRRING  
AERATING, PUMPING, etc.

Manufactured by an exclusive process, MICHIGAN propellers are perfectly balanced to avoid whip and strain on shafts. And because of their superior functioning are now standard parts of the products of many leading equipment manufacturers.

**Available** for special application and replacement, as well as original equipment, in a wide variety of metals and in sizes up to 60". Write for latest data folder.



Side Entering Mixer by  
EASTERN INDUSTRIES  
NEW HAVEN, CONN.

**MICHIGAN WHEEL CO.**  
GRAND RAPIDS 3, MICH.

When inquiring check CP 8609 on handy form, pgs. 2-3

**Durably Built  
for  
Heavy Service!**

"Metalsmiths"  
Stainless Steel  
and Monel  
Utensils

Prompt shipment  
—anywhere!

"Metalsmiths" corrosion-resistant utensils are sturdy, well-designed, long-wearing. Standard in process industries for over 30 years. All items shown, plus beakers, stock pots, batch cans and shovels in stock for prompt shipment.



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**METALSMITHS**  
Division of Orange Roller Bearing Co., Inc.  
856 White Street Orange, N. J.

When inquiring check CP 8610 on handy form, pgs. 2-3

CHEMICAL PROCESSING

### Combine characteristics of metal and ceramics in tube for thermocouples . . .

available in lengths of 12, 18, and 24 inches

**Uses:** For housing and protecting thermocouple wires.

**Features:** Thermocouple protection tube is said to combine thermal conductivity and shock resistance of metal with oxidation and deformation resistance of ceramics.

**Description:** Metal-Ceramic LT-1 thermocouple well has a wall thickness of  $\frac{1}{8}$ ", so time lags in temperature response are reduced. Material itself has a thermal conductivity about the same as cast iron.



Thermocouple well has wall thickness of  $\frac{1}{8}$ "

Available in lengths of 12, 18 and 24", metal-ceramic well can also be supplied in a complete thermocouple assembly: straight connection head extension, and connection head angle wells are offered.

(Thermocouple protection tube is a product of The Bristol Company, Dept. CP, 117 Bristol Rd., Waterbury 20, Conn. . . . or for more information check CP 8611 on handy Reader Service slip which is located between pages 2 and 3.)

### Available in pressurized cans, chemical solvent loosens frozen parts fast

**Uses:** For loosening parts frozen by rust, such as bolts, bearings and bushings.

**Features:** Penetrating solvent is available in pressurized can which permits application with one hand leaving the other free to use tools and loosen frozen parts. Can may be kept in tool kit without danger of leaking.

**Description:** Kroil is a chemical solvent, harmless to metal, with a pleasant odor. It is said to penetrate into places as small as one millionth of an inch, soften rust, dissolve dried grease and oil. Can contains 12 oz of liquid, will shoot a stream up to three feet.

(Chemical Solvent is a product of Kano Laboratories, Dept. CP, 1000 South Thompson Lane, Nashville 11, Tenn. . . . or for more information check CP 8612 on handy Reader Service slip which is located between pages 2 and 3.)



## NO FILTER CAKE DISPOSAL PROBLEM HERE

No danger of running afoul of municipal ordinances . . . no pollution of streams or lakes . . . no clogging or overloading of sewer lines.

With a Niagara Style "H" Horizontal Pressure Leaf Filter there's no sluicing . . . no washing . . . no flushing into the sewer. When filtration is completed, the leaves, mounted on a retractable carriage, roll out on a monorail. Simply tap each leaf with a rubber mallet. The cake drops off cleanly into a hopper cart . . . ready to be hauled away for easy dry disposal.

Of course, that's just one of many advantages provided by the Niagara Style "H" Filter. For instance:

- ★ It will filter liquids to clarity at rates up to 45,000 G.P.H.
- ★ It will give you easy recovery or disposal of as much as 150 cu. ft. of solids at a time.
- ★ It can be taken off stream, drained, opened, cleaned, closed, filled and precoated . . . by one man . . . in a matter of minutes instead of hours.

# Niagara Filters

DIVISION

AMERICAN MACHINE AND METALS, INC.

EAST MOLINE, ILLINOIS

In Europe: Niagara Filters Europe, Post Box 1109, Amsterdam-C, Holland

★ Available in a wide range of capacities, it can be made of stainless steel or special alloys for corrosion resistance.

★ For the great majority of applications, the all-metal leaves require no cloths.

Niagara Pressure Leaf Filters, both vertical and horizontal, are cutting filtration costs, saving time, and improving product quality in hundreds of processing plants all over the country. Let us send you more interesting information. Just clip and mail the coupon . . . no obligation.

### A COMPLETE FILTRATION ENGINEERING SERVICE

Years of experience in designing and producing filtration equipment for hundreds of widely varying applications . . . plus a thorough knowledge of processes and process requirements . . . have built for Niagara engineers a reputation for solving even the toughest filtration problems. We'd like to put this know-how to work for you . . . to test your samples for filterability . . . pilot the filtration for you . . . design, build and install a filter or a complete system to fit your process. Let's talk it over.

Niagara Filters Division, American Machine and Metals, Inc.  
Dept. CP-554, East Moline, Illinois

YES . . . we'd like to know more about Niagara Pressure Leaf Filters for \_\_\_\_\_ (product or operation)

☐ Have representative call ☐ Send Catalog NC1-53

Name \_\_\_\_\_

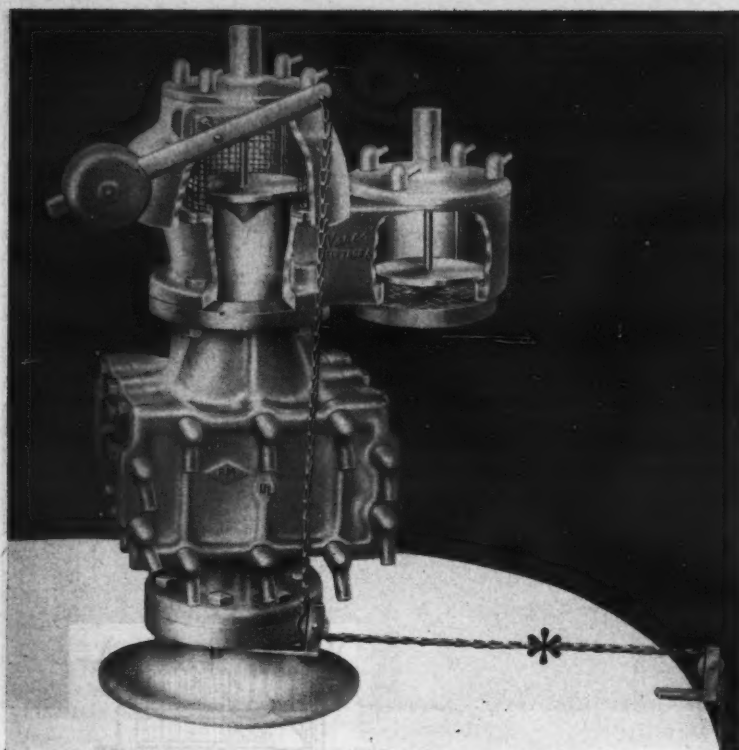
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Company \_\_\_\_\_

Address \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 8613 on handy form, pgs. 2-3





## EFFICIENT VENTING CUTS VAPOR LOSS

Considerable profits are dissipated to the atmosphere when vent pallets warp, stick open or prevent excessive "blowdown." "VAREC" Fig. No. 5800 Conservation Vent Units are ideal equipment for venting volatile or inflammable liquid storage. They protect against dangerous over and under pressures and accidental ignition. Streamlined passages insure maximum flow. Regrindable and renewable metal pallet seats provide extra long life. Drip rings eliminate condensate collection, reducing possibility of freezing. Hyperbolic pallets, loosely guided, prevent sticking and minimize flutter. Flame Arrester unit listed by Underwriters' Laboratories and approved by Factory Mutual Laboratories. Send for free Bulletin CP-2001.

\* Remote Control Flame Snuffer Sheave Brackets, Fig. 130 are optional at extra cost. This assembly is preferable where vent unit is set back from edge of tank.



### THE VAPOR RECOVERY SYSTEMS COMPANY COMPTON, CALIFORNIA

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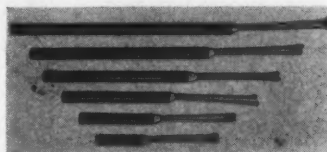
When inquiring check CP 8614 on handy form, pgs. 2-3

## MAINTENANCE

**Higher watt densities,  
longer life offered  
by heating unit . . .**

element is easily installed in  
reamed hole

**Uses:** In critical temperature  
applications such as injection-mold-  
ing machines, pre-plasticers, heat-  
ing forms for shell molding.



Elements manufactured in lengths  
from 1" to 12"

**Features:** Electric heating ele-  
ments were designed and developed  
for higher watt densities and for  
longer life factor. They are easily  
installed in reamed hole due to  
close tolerance on OD.

**Description:** Design of element  
permits manufacture in lengths  
from 1" to 12", in diameters from  
3/8 to 3/4".

(Electric heating elements, called  
Thermacartridges, are products of  
Thermel, Inc., Dept. CP, 3440 W.  
Lake St., Chicago 24, Ill. . . . or  
for more information check CP  
8615 on handy form which is lo-  
cated between pages 2 and 3.)

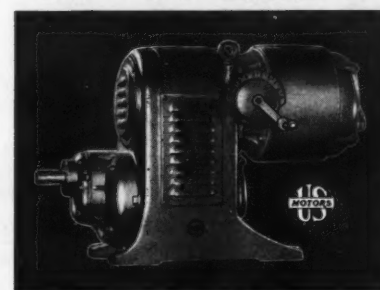
### Includes floor paving specifications

Comprehensive information and  
specifications covering use of  
vitrified paving brick for acci-  
dent-free, cost-saving industrial  
floors are included in 14-page  
manual.

Special section is devoted to  
procedures for laying modern  
brick floors. Also included are  
detailed data on foundations  
and fillers for floors in chemical  
and other plants where they are  
subjected to continuous hard  
use. Actual installation photo-  
graphs supplement text.

Manual on industrial brick  
floors is available from Metro-  
politan Brick, Inc., Dept. CP,  
Canton 2, Ohio. When inquir-  
ing specify CP 8616 on handy  
form which is located between  
pages 2 and 3.

# THOUSANDS OF PLANTS NOW GETTING THOUSANDS OF SPEEDS



## Miracle Motor

### ANY RPM BY DIAL CONTROL

Get more production out of your present  
machines by powering them with U.S.  
Varidrive motors. No extra space required.  
Thousands of plants are profiting with this  
miracle motor. Turning a simple control  
handle changes speed of the Varidrive to  
any desired r.p.m. in ratios up to 10:1.  
Operators can instantly select the speed  
best suited for the work.

### ALL-IN-ONE PACKAGE

Occupies little more space than a single  
speed motor. 1/4 to 50 hp, 2 to 10,000 r.p.m.

## U.S. VARIDRIVE

Mail Coupon for 16-pg. Booklet

### REQUEST FOR VARIDRIVE BOOKLET

U.S. ELECTRICAL MOTORS Inc. CP-5  
Box 2058, Los Angeles 54, Calif. or Milford, Conn.

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ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



When inquiring check CP 8617 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Surge and water hammer damage prevented by controlled closing valve . . .**

easily installed unit protects longer and larger size pipelines

**Uses:** For protection of larger pipe lines against damaging effects of surge and built up pressures or water hammer.

**Features:** Controlled closing valve is said to prevent surge and water hammer damage when filling pipe lines, control speed of line closure, vent air and if necessary, discharge water to prevent damage and admit air to protect against pipe collapse from line breaks.

**Description:** Type CCAV valve is furnished with a 4" diameter flanged inlet opening suitable for bolting directly to a 4" standard flanged fitting in the pipeline. It is easy to install.

In operation, as line is being filled with water, air contained within pipeline is discharged. Upon completion of this process liquid enters valve casing and attempts to float valve to its seat. Under ordinary circumstances this would be accomplished and line would then be sealed with no loss of water resulting. In special circumstances, where excessive surge and water hammer is expected and must be controlled, this quick closing would be defeating the purpose of valve.

Closing action of valve must be controlled for a sufficient length of time to permit discharge of water and dissemination of excess water pressure with consequent reduction of water hammer and resultant damage. This controlled closing is accomplished by adjustment of needle valve which regulates flow of retarding liquid from lower to upper section or storage chamber of retarding unit.

There is no standard timing setting for rate of closure of valve and each unit must be adjusted to suit operating conditions at specific point of installation. Existing installations show a wide range of timing requirements. This valve, by itself, is not designed to function as an automatic and periodic air release unit. This operation may be accomplished by addition of manufacturer's Type AGFD air release valve.

(Controlled closing valve is a product of Simplex Valve & Meter Co., Dept. CP, 68th & Upland Sts., Philadelphia 42, Pa. . . . or for more information check CP 8618 on handy form which is located between pages 2 and 3.)

**Packless, leakproof rotary joints described in bulletin**

Construction and operation of ball-and-socket Phillips rotary joints are described in four-page bulletin. Typical installations of these leakproof, packless joints are illustrated.

"Phillips Rotary Joints" is issued by Key Co., Dept. CP, 27th & McCasland Ave., East St. Louis, Ill. When inquiring specify CP 8619 on handy form, pages 2 and 3.

# SOLVENT RECOVERY...

*how Armour got performance as ordered*

You know how important it is to have a process measure up to expectations . . . and how difficult this is to achieve. When the Armour Laboratories needed a solvent recovery unit for its new Pharmaceutical Center, Pfaudler submitted quotation on a "complete package." Included in this "complete package" were the best of pharmaceutical engineering ideas.

Intended for recovering alcohol used in making insulin, liver extracts, gamma globulin and similar biologicals, it was essential to have equipment that would prevent contamination of the recovered alcohol. Knowing this and input-and-output requirements, Pfaudler process engineers went to work.

**A package in 316 stainless steel**

As a result, Pfaudler designed, built and installed the "package" distinguished by the 53-ft. distillation tower shown. Heat exchangers, pumps, valves, piping and other components make up the assembly. It was all built of type 316 stainless steel to avoid rusting and metal pickup from the salts present in organic material. What's most important, the unit is performing for Armour as ordered.

Here is just one more example of how you can depend on Pfaudler experience and skill to deliver "complete package units" that give you the results you want.

**No limit on fabrication requirements**

Try us out on your requirements—whether it involves a complete process assembly or individual units. Our facilities permit us to fabricate everything from glassed steel to alloys and clad materials. Our heat-treating furnaces are among the largest in use. Send for Bulletin 902-CA-5 . . . it explains how you can use Pfaudler process engineering to advantage.

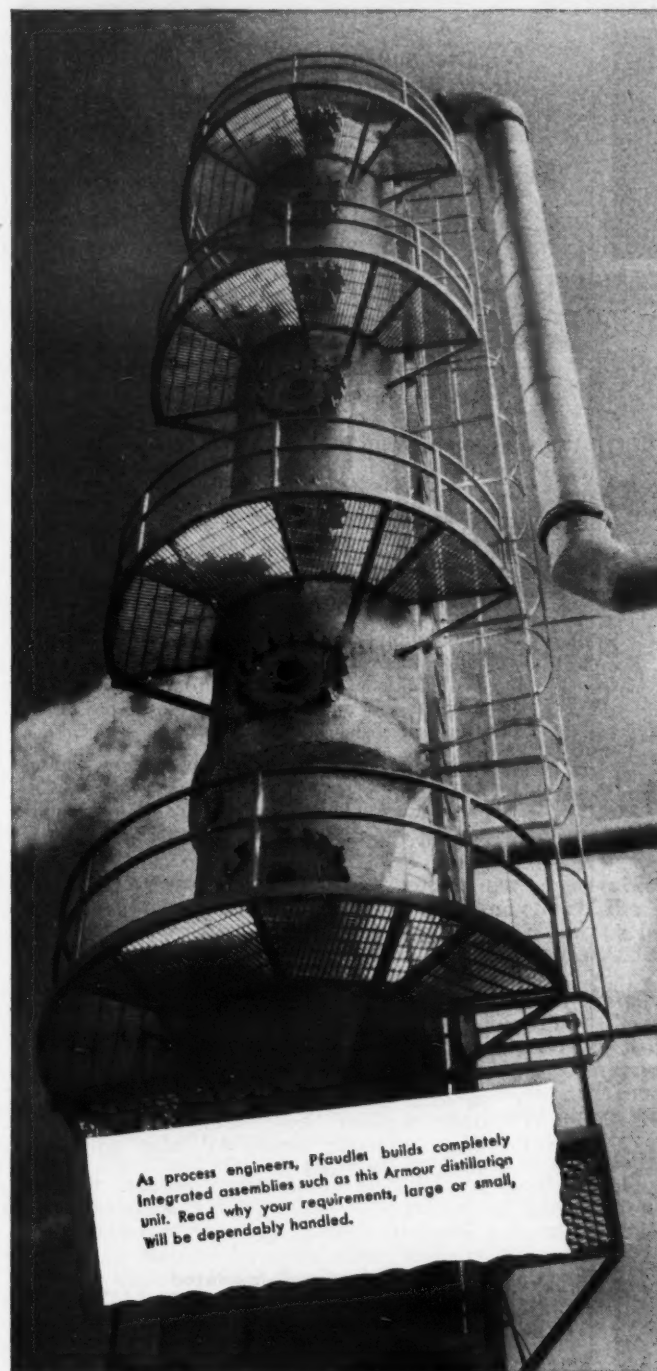
**THE PFAUDLER CO.**



**ROCHESTER 3, N. Y.**

GLASSED STEEL • HASTELLOY • ALUMINUM • CARBON STEEL • SOLID OR CLAD STAINLESS STEEL • NICKEL • INCONEL • MONEL

When inquiring check CP 8620 on handy form, pgs. 2-3



As process engineers, Pfaudler builds completely integrated assemblies such as this Armour distillation unit. Read why your requirements, large or small, will be dependably handled.

RPM

pgs. 2-3

SSING

MAY, 1954





Sanitary applications include coils for cream heaters and coolers fabricated by The Creamery Package Mfg. Company.

This is what we mean by

# Bendability

When stainless steel tubing, or pipe, is easy to coil, you can avoid a lot of production headaches.

That's one big reason why manufacturers like The Girdler Company, makers of heavy industrial equipment, and The Creamery Package Mfg. Company, makers of dairy and food processing equipment, use ELECTRUNITE Stainless Steel Tubing and Pipe. It's uniformly ductile, easily workable. The result: smooth, accurate coils.

There are other advantages, too. Wall thickness is uniform. So are diameter, concentricity and strength. And ELECTRUNITE Tubing or Pipe meets any one of the following ASTM Specifications: A-249, A-269, A-270, A-312 in Stainless Steel analyses. It's also made to meet many customer specifications.

Before you consider new equipment, or replacements, get all the facts about ELECTRUNITE Heat Exchanger Tubes. Available in carbon or stainless analyses. Write for CEC-54.

## REPUBLIC STEEL CORPORATION Steel and Tube Division

206 East 131st Street, Cleveland 8, Ohio  
GENERAL OFFICES • CLEVELAND 1, OHIO  
Export Department: Chrysler Building, New York 17, N. Y.



ELECTRUNITE—The Original Electric Welded Boiler Tube

When inquiring check CP 8621 on handy form, pgs. 2-3

## New Literature

### Colorful bulletin shows filters

Manufacturer's line of filters is illustrated and described in multi-color 12-page bulletin. Filters feature either ceramic and porous carbon filtering medium and require no disassembling for cleaning. Filtering and backwash cycles are shown in three-color cross-sectional diagrams. Cut-out views of various models are included.

Photographs show package filtration plants installed by manufacturer. Flow diagrams illustrate various filter installations, including piping, valves, and equipment.

Bul 431 is issued by R. P. Adams Company, Inc., Dept. CP, 242 E. Park Drive, Buffalo 17, N. Y. When inquiring specify CP 8622 on handy form, pages 2 and 3.

### Outline vinyl processing with polyethylene lube

Lubricating action of company's polyethylene in vinyl processing is presented in bulletin. Also outlined is a tabular comparison between this material and release agents in use in processing vinyl sheet and film.

Bul 4 is issued by Semet-Solvay Petrochemical Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N. Y. When inquiring specify CP 8623 on handy form, pages 2 & 3.

### Chemistry and physics handbook

Thirty-fifth edition of "Handbook of Chemistry and Physics" keeps this all-embracing 3000-page volume abreast of the latest scientific developments in the fields of research. Handbook may be obtained by remitting \$8.50 direct to The Chemical Rubber Co., Dept. CP, 2310 Superior Ave., Cleveland 14, Ohio. When inquiring specify CP 8624 on handy form, pages 2 and 3.

### Illustrates line of well-insulated thermocouple, extension wires

Eight-page bulletin illustrates and describes well-insulated thermocouple and extension wires most often used for standard pyrometric work. Wires featured are those with plastic insulations, fibreglas insulations, asbestos insulations,

MIL spec insulations, and metallic armor.

Calibrations, gages, and strandings are listed. Calibration symbols, ISA and US Military color codes, and insulation characteristics are described in chart form. Two pages of additional charts contain engineering data.

Bul 31 is available from Thermo Electric Co. Inc., Dept. CP, Saddle River Township, Rochelle Park Post Office, N. J. When inquiring specify CP 8625 on handy form, pages 2 and 3.

### Two bulletins describe 400cy motors

Miniature hysteresis-synchronous motors adapted for power, servo, or timing applications are described and diagrammed in two two-page bulletins. Features, performance data, and dimensions of the 2- and 4-pole, 400 cycle motors are included.

Bul X-3 and X-4 are issued by Globe Industries, Inc., Dept. CP, 1784 Stanley Ave., Dayton 4, Ohio. When inquiring specify CP 8626 on handy form located between pages 2 and 3.

### Remote control operation of tractor described

Illustrated eight-page bulletin describes manufacturer's radio remote control operation of TractorOx. "Radox" (radio) control eliminates costly man-hours, make order-filling a one-man job.

Bulletin, in two colors, also lists maker's line of lift trucks, pallets, etc.

Bul 534 is issued by Barrett-Cravens Co., Dept. CP, 4663 S. Western Blvd., Chicago 9, Ill. When inquiring specify CP 8627, pages 2 & 3.

### Gives applications and features of thermometer controller

Representative applications and complete specifications for remote-bulb thermometer indicator and controller is given in ten-page bulletin. Tables list thermal system selection, ranges, and bulb style data.

Bul 6401 is issued by Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne and Windrim Aves., Station 64, Philadelphia 44, Pa. When inquiring specify CP 8628 on handy form, pages 2 and 3.

**Illustrates and describes line  
of hot water storage heaters**

Complete line of hot water storage heaters is described and useful information on piping arrangements and installation are presented in 48-page catalog.

Horizontal and vertical heaters in various materials and linings are cataloged as to weight, dimensions, construction details, and capacities — with conversion tables. Piping diagrams are given for high- and low-pressure steam systems. Also included is a guide for setting up and connecting a storage heater.

Cat 18 is issued on letterhead request to The Patterson-Kelley Co., Inc., Dept. CP, 346 Warren St., East Stroudsburg, Pa.

**Pictures typical castings  
for industrial use**

Twelve-page booklet describes manufacturer's line of industrial castings of ductile iron. Properties, characteristics, and applications are presented for three standard grades of casting produced by two divisions of company. Pictured are typical castings for use in chemical, diesel, aviation, and general industrial fields.

Form H-101 is available from Dept. A, American Brake Shoe Co., Dept. CP, 230 Park Ave., New York 17, N.Y. When inquiring specify CP 8629 on handy form which is located between pages two and three.

**Outlines production facilities  
for metal fabrication**

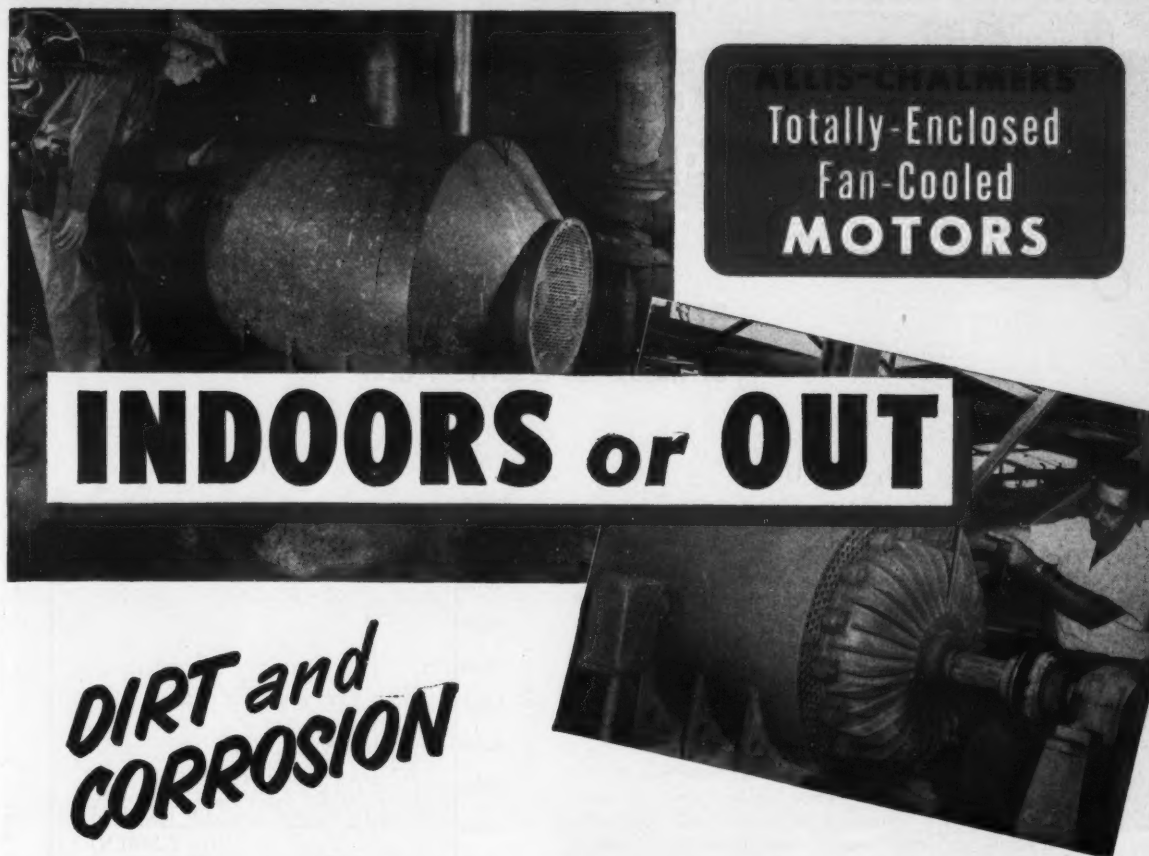
Illustrated 4-page bulletin describes line of steel, aluminum, and alloy products manufactured by firm. Metal working facilities including painting and welding specialties are included.

Bul 142 is issued by Falstrom Co., Dept. CP, 98 Falstrom Court, Passaic, N.J. When inquiring specify CP 8630 on convenient slip between pages two and three.

**Pinpoints grade of activated carbon  
to be chosen for specific use**

Notebook-size chart aids in selection of correct grade of activated carbon most likely to be found suitable for specific adsorption problems.

Copies of "Adsorbite Type Selection Chart" are available from Barnebey-Cheney Co., Dept. CP, N. Cassady at 8th Ave., Columbus 19, Ohio. When inquiring specify CP 8631 on handy form, pages 2 and 3.



**Totally-Enclosed  
Fan-Cooled  
MOTORS**

**INDOORS or OUT**

**DIRT and  
CORROSION**

**Can't Hurt These Motors**

**Here is a totally-enclosed type of motor** that will solve many of your dirt and corrosion problems. Install anywhere, indoors or out.

**Cooling System is Self-cleaning**

Cooling air is carried through the heat-exchanger tubes with sufficient velocity to expel practically any kind of dirt. If oily or sticky dirt should cling, tubes can be ramrodded clean in a few minutes because tubes are straight and tube ends are exposed.

**Choice of Corrosion-resistant Materials**

You can lick corrosion with this motor, too. Tubes are available in a variety of materials to meet practically any corrosive atmospheric condition. Allis-Chalmers tube-type motors have long and successful experience in such difficult applications as caustic plants, refineries and petrochemical plants, power plants with fly ash problems and many others.

Next time you need a motor for a dirty or corrosive location or for outdoor operation in all kinds of weather, call your Allis-Chalmers District Office. Get complete information on Allis-Chalmers tube-type totally-enclosed, fan-cooled and explosion-proof motors. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7149. Available in ratings on frames larger than NEMA 505 up to 3000 hp.

A-4222

Texrope and Vari-Pitch are Allis-Chalmers trademarks.

**ALLIS-CHALMERS**

When inquiring check CP 8632 on handy form, pgs. 2-3

**Sold . . .**

**Applied . . .**

**Serviced . . .**

by Allis-Chalmers Authorized Distributors, Certified Service Shops and Sales Offices throughout the country.



**CONTROL** — Manual, magnetic and combination starters; push button stations and components for complete control systems.

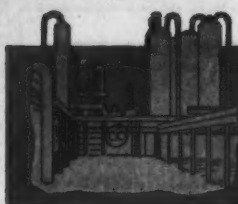
**TEXROPE** V-belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.



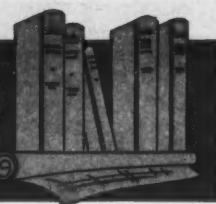
**PUMPS** — Integral types from 1/2 in. to 72 in. discharge and up.







## Processing and Engineering Data



79a

### SIZING BATTERIES For Industrial Electric Trucks

By B. I. ULINSKI

Automatic Transportation Company

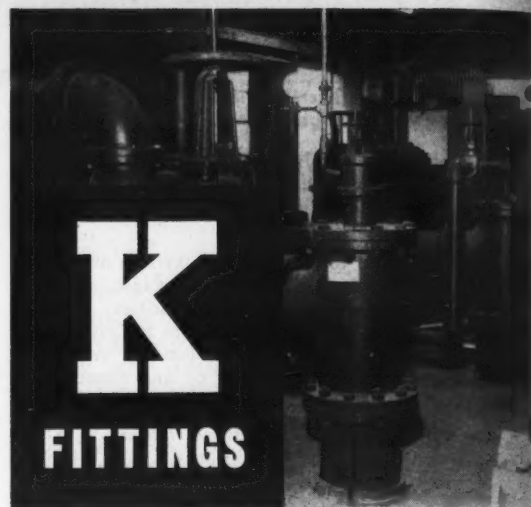
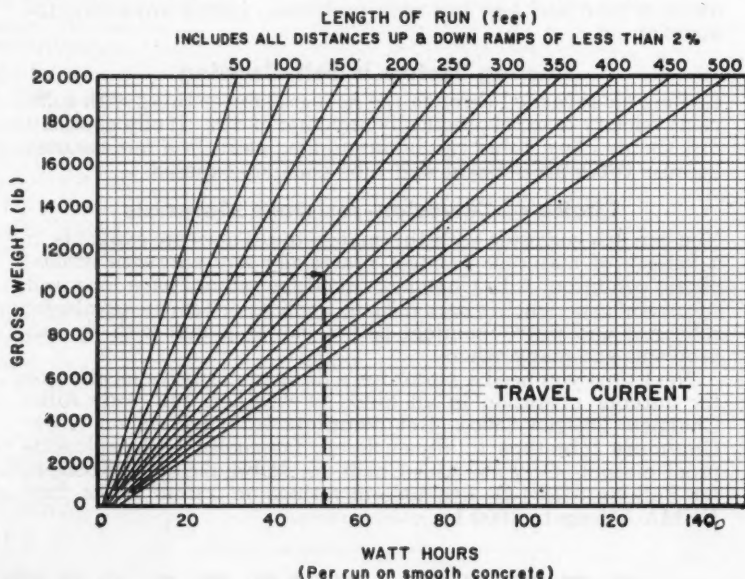
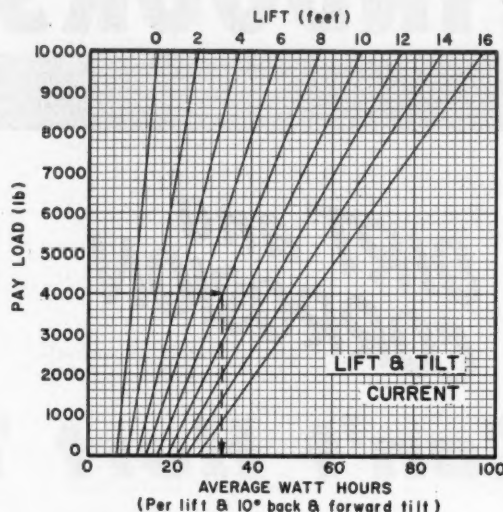
In specifying batteries for electric trucks the prime consideration is how much work will batteries have to do between charges. Where they can be charged only once during a shift, batteries have to have enough capacity. Where more frequent charging is needed, it is helpful to know how often they should be charged.

Graphs given here supply accurate information for manufacturer's trucks. They can be applied to most electric trucks. Accuracy of final results, however, depends on careful observation of operating conditions. For estimations a 25% safety factor can be added.

An important potential source of error is "start-and-stop" operation. Considerable work is required for acceleration of the truck and its load. Note that "Travel Current" chart shows that 52.5 watt hours are required for a gross weight travel of 300'. If this run were made with six stops (six 50' runs) work requirements would be  $6 \times 17.5$  or 150 watt hours. This is just twice as much!

#### Typical Examples

A lift truck is to be run on one charge per eight-hour day. Making 11 trips per hour, truck weighs 6800 lb, carries 4000-lb load. One-way distance traveled is 300'. An eight-foot lift is required and path includes a ramp (elevation of five feet) to be climbed by the loaded truck. What size batteries should be specified?



### FOR SEVERE SERVICE

In the photo are seen some big "K" flanged tees and elbows; also Kuhns companion flanges and screwed elbows.

The principal usage of "K" flanged and extra heavy fittings is in installations where the requirements are severe and exacting—notably the chemical, food, synthetic, paper, textile, and ceramic industries.

"K" Fittings are close-grained, tough, smooth, symmetrical. Faces of flanged fittings are accurately milled, bolt holes exactly spaced. Threads of tapped fittings are chased full and clean; openings chamfered so pipe will enter easily.

It pays to order fittings from distributors who handle the "K" line.

**K PIPE FITTINGS**  
CAST IRON AND MALLEABLE  
3,000 Shapes and Sizes

Catalog upon official request.

**THE  
KUHN  
BROTHERS  
COMPANY**

1808 McCALL ST.  
DAYTON 1, OHIO

Established 1887

Stocks in Dayton  
Los Angeles  
Oakland, Calif.  
Branford, Conn.

When inquiring check CP 8633 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Water demineralizers covered  
in 20-page catalog**

Mixed-bed, two-bed, and four-bed demineralizers for industrial and laboratory use are covered in illustrated 20-page publication.

Photographs, drawings, and diagrams explain in detail principles, construction, and operation of units, which range from 5 to 2500 gph in capacity. Catalog gives dimensional and performance data of models, tells difference between distilled and demineralized water, and presents factors to consider when selecting equipment for a given job.

Approximately 200 users of manufacturer's equipment are listed.

Cat 127 is issued by Barnstead Still and Sterilizer Company, Dept. CP, 239 Lanesville Terrace, Forest Hills 31, Mass. When inquiring specify CP 8634 on handy form, pages 2 and 3.

**Thirteenth in a series —  
tall oil for resins**

Four-page bulletin discussing tall oil for resins is thirteenth in series. Various uses, properties, and reactions are covered. Extensive list of references is included in bulletin.

Bul 13 is issued by The Tall Oil Association, Dept. CP, 122 East 42nd St., New York 17, N. Y. When inquiring specify CP 8635 on handy form, pages 2 and 3.

**Uses of amplidyne systems  
described, illustrated**

Amplidyne systems, how they operate, and where they can be used are described in a two-color, 24-page booklet. Included are multicolor cross-sections, circuit diagrams, charts, and photographs. Electrical principles of "the short circuit that moves mountains" are explained step-by-step, and applications are described and illustrated.

Bul GEA-4053B is issued by General Electric Co., Dept. CP, 1 River Rd., Schenectady 5, N. Y. When inquiring specify CP 8636 on handy form, pages 2 and 3.

**Venturi tube has  
elliptical throat**

Technical brochure explains elliptical Venturi used with heavily sedimented liquids. Five pages in length, it contains drawings and engineering details of this flow element for pipe lines measuring from 12 to 84 inches in diameter.

Elliptical Venturi brochure is issued by Simplex Valve & Meter Co., Dept. CP, 68th and Upland St., Philadelphia 42, Pa. When inquiring specify CP 8637 on handy form, pages 2 and 3.



## A quality curve for vacuum

Here's the performance curve for the Kinney 311 cubic foot vacuum pump — Model DVD 14.9.18. Where high, fast vacuum is needed . . . in lamp works, power plants, cable impregnating operations, altitude chambers, coaters, and hundreds of other applications . . . this is the pump to pick. Model DVD 14.9.18 maintains high pumping speed in the low absolute pressure ranges . . . the reason why leading process companies depend on this vacuum pump for reliable, efficient operation.

Kinney district offices are staffed with competent vacuum engineers, ready to help you get the right vacuum pump for your needs. Send coupon for complete details.

Free air displacement of 311 CFM at 360 RPM — 15 HP motor.

Designed for easy accessibility of working parts.

Famous Kinney-perfected oil sealed pumping system.

Ask about special design for water-vapor removal.

**KINNEY MFG. DIVISION**

THE NEW YORK AIR BRAKE COMPANY

3573 WASHINGTON STREET • BOSTON 30 • MASS.


☐

Please send Bulletin V51B describing the complete line of Kinney Vacuum Pumps.

☐

Our vacuum problem involves \_\_\_\_\_

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

When inquiring check CP 8638 on handy form, pgs. 2-3





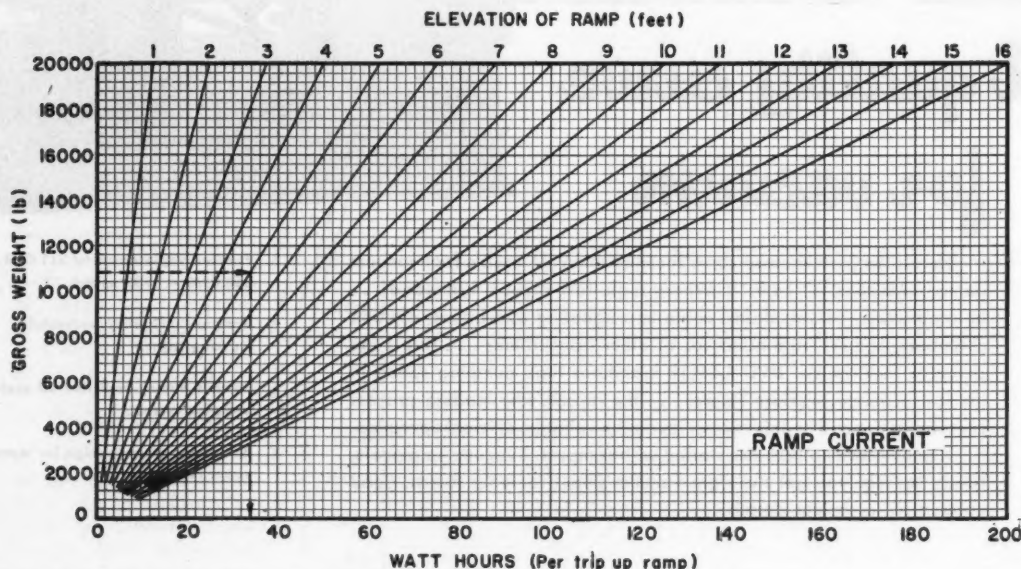
## Sizing Batteries for Industrial Electric Trucks

Travel current can be found by running a horizontal from gross weight of 10,800 lb to the 300' length of run on the travel current graph. Work required for loaded one-way run is 52.5 watt hours. Return trip will be gross weight of 6800 lb to the 300' line (not shown) or 34 watt hours. Total travel current is 52.5 + 34 or ..... 86.5 watt hours.

Lift and tilt current is found in the same way with the appropriate graph. Lifted load is 4000 lb; there is only one lift per trip ..... 33 watt hours.

Ramp current is only a drain on the loaded trip. Moving this gross weight of 10,800 lb up the five foot elevation costs ..... 34 watt hours.

Total work per round trip is the sum of these — 153.5 watt hours. And 11 trips per hour for eight hours would be 88 trips. This means (153.5 x 88) or 13,500 watt hours per day. Minimum battery capacity is then 13.5 kw-hr. Safety factor of 25% would bring this up to 17 kw-hr.



## It's Economical to handle your small PULVERIZING JOBS with the Raymond RAY-DUCER



BUILT IN  
THREE SIZES

This compact unit is specially designed for grinding and disintegrating a wide range of medium soft materials to specified screen fineness.

Its quick accessibility is an important time-saving feature when making different grades, mixtures or types of products — only a few seconds required to open machine for clean-out or screen changes.

Ease of operation, small power requirements, low maintenance and long service life make the Raymond RAY-DUCER a low-cost producer of powdered materials.



Write for Bulletin No. 73 which tells details and applications of Raymond's latest type pulverizing mill.

### COMBUSTION ENGINEERING, INC.

RAYMOND DIVISION  
1317 North Branch Street  
Chicago 22, Illinois  
Sales Offices in Principal Cities

When inquiring check CP 8639 on handy form, pgs. 2-3

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**Photoelectric side register control system explained**

Photoelectric side register control systems, how they operate and what they do, are described in two-color, eight-page bulletin.

"Two-point" and "proportional" register systems are used on slitting, rewinding, side-trimming, and printing operations. Drawings, text show uses for two-point (moderate speed runs) and proportional (high speed runs) systems. Component parts, installations are given.

Bul GEA-5947 is issued by General Electric Co., Dept. CP, One River Road, Schenectady 5, N.Y. When inquiring specify CP 8640 on handy form, pages two and three.

**Seventeen sizes of packaged automatic boilers presented**

Packaged automatic boilers in 17 sizes from 15 through 500 hp for steam process as well as steam and hot water heating service are described in 16-page bulletin. Specifications and illustrations cover the boiler, burner and control systems of units. Useful reference data on boilers are included.

Bul 1219 is available from Orr & Sembover, Inc., Dept. CP, Morgantown Rd., Reading, Pa. When inquiring specify CP 8641, pages 2 and 3.

**Covers variety of applications for SESC pumps**

Entire line of SESC (Standard End Suction Centrifugal) pumps covering wide variety of applications and offering maximum interchangeability of parts is described in four-page bulletin. Line covers six types of pumps with varieties of mountings, frames and drives. Bulletin includes charts to illustrate coverage provided by these pumps.

Bul W-300-B4 is issued by Worthington Corp., Centrifugal Pump Div., Dept. CP, Harrison, N. J. When inquiring specify CP 8642 on handy form, pages 2 and 3.

**Folder answers need for information on stabilizing animal fats**

Renderers and feed manufacturers will find in folder a discussion of feed markets for animal fats, reasons why these fats must be stabilized in order to avoid rancidity in storage, and an outline of the research behind development of manufacturer's liquid antioxidant, Tenox R.

"Tenox R" is issued by Eastman Chemical Products, Inc., Dept. CP, Kingsport, Tennessee. When inquiring specify CP 8643, pages 2 and 3.

which  
impulse  
for you?



**STANDARD**

The standard YARWAY Impulse Steam Trap serves all normal trapping requirements. Factory set to operate without adjustment at all pressures from 20 psi to 400 psi (Series 60) and 600 psi (Series 120). For pressures below 20 psi, merely remove split washer.

*Numerous advantages like:*

- small size
- quick heating
- steady temperatures
- stainless steel construction
- one moving part
- non-freezing
- low cost

More than 900,000 used throughout industry.

Write for YARWAY Bulletin T-1740.

**HIGH PRESSURE, INTEGRAL STRAINER**

YARWAY Integral Strainer High Pressure Impulse Steam Traps operate on some of the highest pressure steam lines in the country. Same operating principle as the standard YARWAY Impulse Trap. Strainer built into trap.

Ample capacity when system is being "warmed up"—yet will handle relatively small amounts of high temperature condensate without losing prime. Six sizes— $\frac{1}{2}$ " to 2". Pressures to 1500 psi (flanged ends) or 2500 psi (welding ends).

Write for YARWAY Bulletin T-1740.

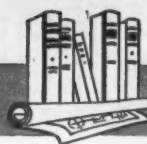
**YARNALL-WARING COMPANY**  
125 Mermaid Avenue, Philadelphia 18, Pa.

**impulse steam traps**

YARWAY Impulse Steam Traps and Fine Screen Strainers are stocked and sold by more than 250 convenient local distributors. Write for name of one nearest you.

When inquiring check CP 8644 on handy form, pgs. 2-3





## Sizing Vacuum Pumps and Piping

By GORDEN KIDDOO

Engineer, National Research Corporation

These two nomographs permit rapid estimation of size of vacuum pump needed for given conditions and size of vacuum piping required. Unless vacuum piping is of large enough diameter, restriction of flow will result in loss of pumping efficiency.

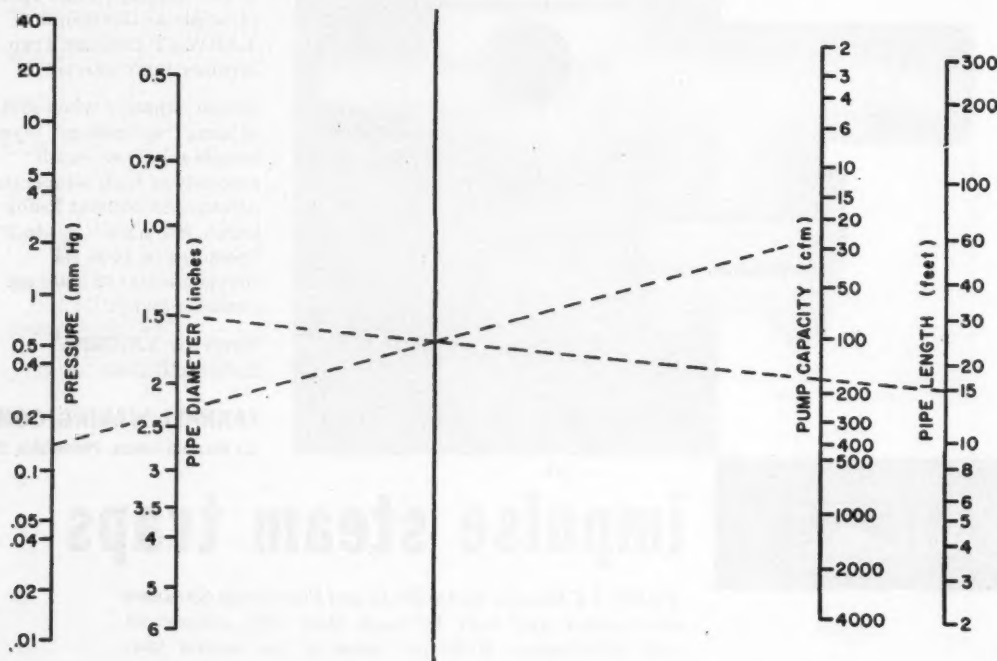
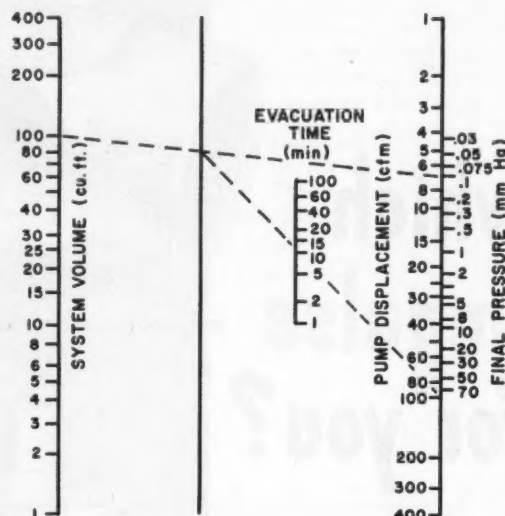
### Typical Examples

A system of 100 cu ft must be reduced to an operating pressure of 0.1 mm Hg in 12 minutes. What size pump should be specified?

Connect volume of 100 with pressure of 0.1 and note intersection at reference line. Run a straight-edge from this intersection through 12 minutes on time scale. Intersection on pump displacement scale shows that a 100 cfm pump is needed.

A 25 cfm pump is to attain a working pressure of 0.15 mm Hg. If 15' of vacuum piping are used, what diameter should this piping be?

Connect pressure of 0.15 with displacement of 25. Note intersection on reference line. Align this point with piping length of 15' and read required diameter as 1 1/2".



**HE'S A C.P.A.**  
Certified Public Accountant

Both  
these  
**SPECIALISTS**  
help  
you  
operate  
efficiently,  
reduce  
wasteful  
spending



No business would attempt to operate very long without the services of an accounting specialist.

And, no liquid handling program should be started without the guidance and recommendations of a WEINMAN Centrifugal Pump Specialist.

This man knows how to reduce your pumping costs by improving pumping efficiency and capacity. He can specify the right pumps for your needs with confidence, because that is his business — because his career and his success depend upon his ability to do so.

So, if you're considering the installation of new pumps, or the improvement of your present liquid handling system, call in a specialist . . . a WEINMAN Centrifugal Pump Specialist.

Representatives  
in principal  
cities.

**WEINMAN**

When inquiring check CP 8645 on handy form, pgs. 2-3

CHEMICAL PROCESSING

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**Tables "tell" right heater or heat exchanger for job**

Hot water storage heaters and heat exchangers are covered in 16-page catalog complete with drawings. Included are horizontal and vertical storage heaters, condensate coolers, instantaneous hot water heaters, converters, fuel oil heaters, and suction heaters for viscous fluids. In each case, tables simplify selecting unit for a specific job.

Cat 5 is issued by Patterson-Kelley Co., Inc., Dept. CP, 345 Warren St., East Stroudsburg, Pa. When inquiring specify CP 8646 on handy form, pages two and three.

**Pictures controlled air weight laboratory oven**

Manufacturer's controlled air weight oven is illustrated and outlined in two-color, four-page bulletin. Unit features constant air weight circulation at all temps, with automatic control. Text tells how oven works, lists additional features, capacities, and specifications.

"Con-Wate Oven" is issued by the Emil Greiner Co., Dept. CP, 20-26 N. Moore St., New York 13, N. Y. Specify CP 8647, pages 2 and 3.

**Protected mercury switches withstand damages**

Data sheet explains how protected mercury switches can be used in locations where ordinary glass tube mercury switches might be damaged. Embedding material gives protection and provides seal and electrical insulation around lead entrance.

Enclosure simplifies mounting, enabling unit to be rigidly screw mounted to moving parts or pivoted on pins for tilt operation. Electrical ratings and specifications are included.

Data Sheet 90 is issued by Micro, a Div. of Minneapolis-Honeywell Regulator Co., Freeport, Ill. When inquiring specify CP 8648 on handy form, pages 2 and 3.

**Explains theory and design of dust collectors**

Full explanation of theory and design of company's dust collectors and drawings of various collector systems are included in eight-page bulletin. General problem of dust collection in processing industries is discussed. Photographs of recent installations supplement text.

Bul 171 is available from The Green Fuel Economizer Co., Inc., Dept. CP, 905 Main Street, Beacon, N. Y. When inquiring specify CP 8649 on handy form, pages 2 and 3.

**Crane 125-Pound Iron Body****Wedge Gate Valves are an**

**improved design, embody-**

**ing many features of un-**

**usual merit. They set a new**

**peak for quality in iron body**

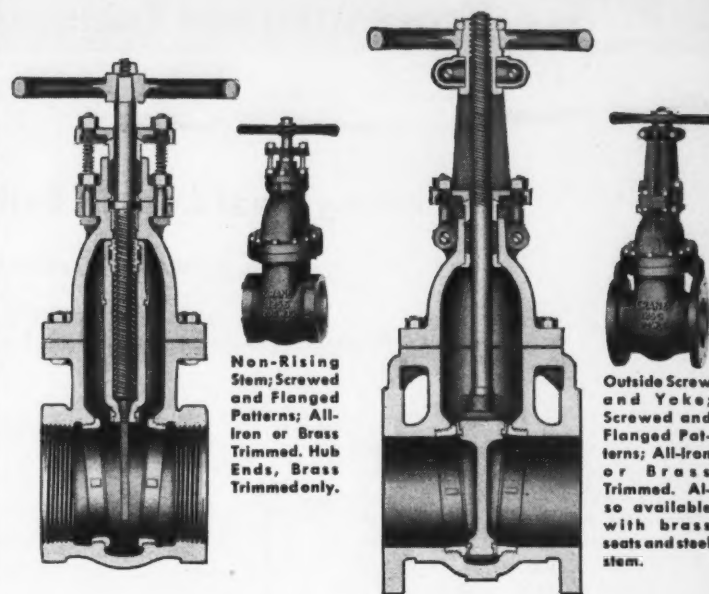
**wedge gate valves, having**

**greater strength, longer life,**

**and better all-round adapt-**

**ability for all types of**

**services.**



Non-Rising Stem; Screwed and Flanged Patterns; All-Iron or Brass Trimmed. Hub Ends, Brass Trimmed only.

Outside Screw and Yoke; Screwed and Flanged Patterns; All-Iron or Brass Trimmed. Also available with brass seats and steel stem.

# See If You Don't Agree!

## Here's the big value — the big selection: CRANE 125-Pound Iron Body Wedge Gates

... with quality features that assure exactly the kind of service you want. Body and bonnet are oval-shaped with extra metal where it's needed most, to provide liberal strength. Flanged patterns have tie-ribs between body and bonnet flanges. You also get a solid web-type disc with long guides ... a stem of liberal diameter with long thread engagement ... an exceptionally deep stuffing box with high-grade packing ... a two-piece ball-type gland and flange—plus an easy-to-grip handwheel with oval-shaped rim. Non-rising stem valves have a brass bushed stem collar. OS&Y design includes a brass bonnet bushing, swinging eye bolts ... and a tee-head disc-stem connection on sizes 12-inch and smaller.

Big selection includes all-iron or brass trimmed valves ... Underwriters' pattern valves, quick-opening types ... valves for process industries ... valves for marine service. Sizes up to 48-inch. Check your Crane Catalog or ask your Crane Representative next time he calls.

THE BETTER QUALITY... BIGGER VALUE LINE... IN BRASS, STEEL, IRON

# CRANE VALVES

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Illinois  
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

When inquiring check CP 8650 on handy form, pgs. 2-3







## Estimating Heat Loss in Boiler Flue Gases

By GEORGE E. MAPSTONE

Edited by D. S. DAVIS

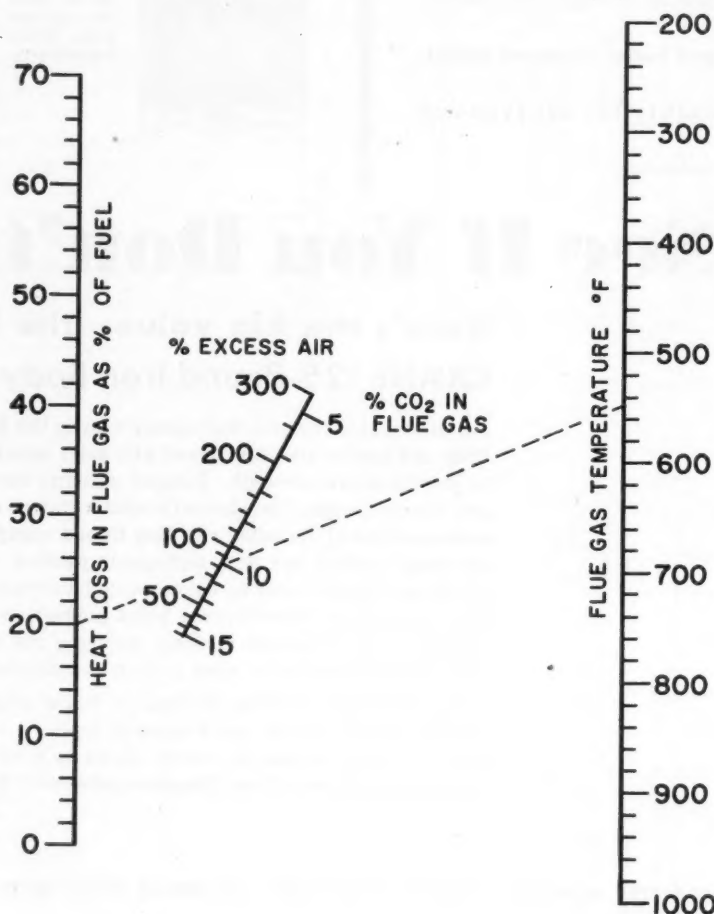
Professor of Chemical Engineering Virginia Polytechnic Institute




Since the principal purpose of operating a boiler is to transfer heat to water or some other medium, heat used to increase temperature of flue gases is wasted. Air in excess of the amount needed for complete combustion increases such losses. If fuel composition is known, amount of excess air can be calculated from flue gas analysis. Flue gas temperature is easily measured. This nomograph shows both excess air and heat loss when temperature and analysis of flue gas are known. It was designed specifically for bituminous coal with a heat content of 14,400 Btu/lb.

### Typical Example

Flue gas contains 10.1% carbon dioxide and has a temperature of 550°F. How much excess air is being used and what is the heat loss to flue gases?

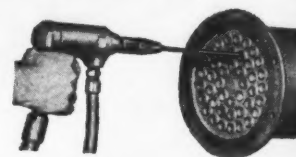
Using a straightedge, connect 550°F on temperature scale with 10.1% CO<sub>2</sub>. Intersection of straightedge shows 20% loss in fuel and 80% excess of air.



It's a cinch  to clean any size  heat exchanger tube  the Wilson way!

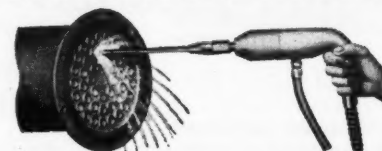
Why put up with the delays and the high costs of makeshift tube cleaning methods? Wilson has exactly the tube cleaner you need to do the job quickly, thoroughly, economically. Wilson's complete line of fast-acting tube cleaners includes the popular PG for  $\frac{3}{8}$ " to 1", the PGX for intermediate sizes  $\frac{1}{2}$ " to  $1\frac{1}{2}$ ", and the TP-301 for up to  $2\frac{7}{8}$ " ID.

### For Small Sizes MODEL PG PISTOL GRIP TUBE CLEANER



The fast, efficient Pistol Grip Tube Cleaner provides the operator with one-hand control for cleaning small, straight tubes. Weighs only 3 lbs.—no more than a 12" Stillson wrench.

### For Intermediate Sizes MODEL PGX TUBE CLEANER



Positive drive (not geared down) high speed, rotary shaft, air-driven scavenger type cleaner. Washes out tube and debris as it cleans, keeping drill bit cool at the same time. For either vertical or horizontal applications, straight or curved tubes.

### For Heavy-Duty Service MODEL TP-301 TUBE CLEANER



Suitable for vertical or horizontal use in straight or curved tubes  $\frac{3}{8}$ " ID to  $2\frac{7}{8}$ " ID and up to 40' long. Cleans rapidly, thoroughly, operating at high speed at 90 psi. Can run on pressure as low as 50 psi.

Representatives  
in all principal cities

WRITE FOR BULLETIN TW-829

Thomas C. Wilson, Inc., 21-11 44th Ave., Long Island City 1, N. Y.  
CABLE ADDRESS: "TUBECLEAN" NEW YORK

**WILSON**  
TUBE CLEANERS • TUBE EXPANDERS

When inquiring check CP 8651 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## NEW LITERATURE

### Water and gas line scale removal detailed on fact sheet

Brief case histories included in 2-page fact sheet describe removal of scale from water and gas lines. Pictures show results. Diagram illustrates hookup for chemical cleaning of boiler feed water line. Advantages of service offered are detailed.

Dowell Service Bulletin is issued by Dowell Incorporated, a service subsidiary of The Dow Chemical Company, Dept. CP, Kennedy Building, Tulsa 1, Okla. When inquiring specify CP 8652 on handy form, pages 2 and 3.

### Instructs employees on safe work habits

Handy 32-page booklet contains instructions in safe work habits applicable to employees in most plants. The practical experiences of workers, supervisors and safety specialists have established the safe practices covered. These begin with a list of general safety regulations and continue with special sections on machine operation, hand tools, power tools, protective clothing, fire prevention, materials handling and many related topics.

A sample copy of "Working Together for Safety" may be obtained from the National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago 11, Ill. When inquiring specify CP 8653 on handy form, pages 2 and 3.

### Properties and characteristics of industrial castings

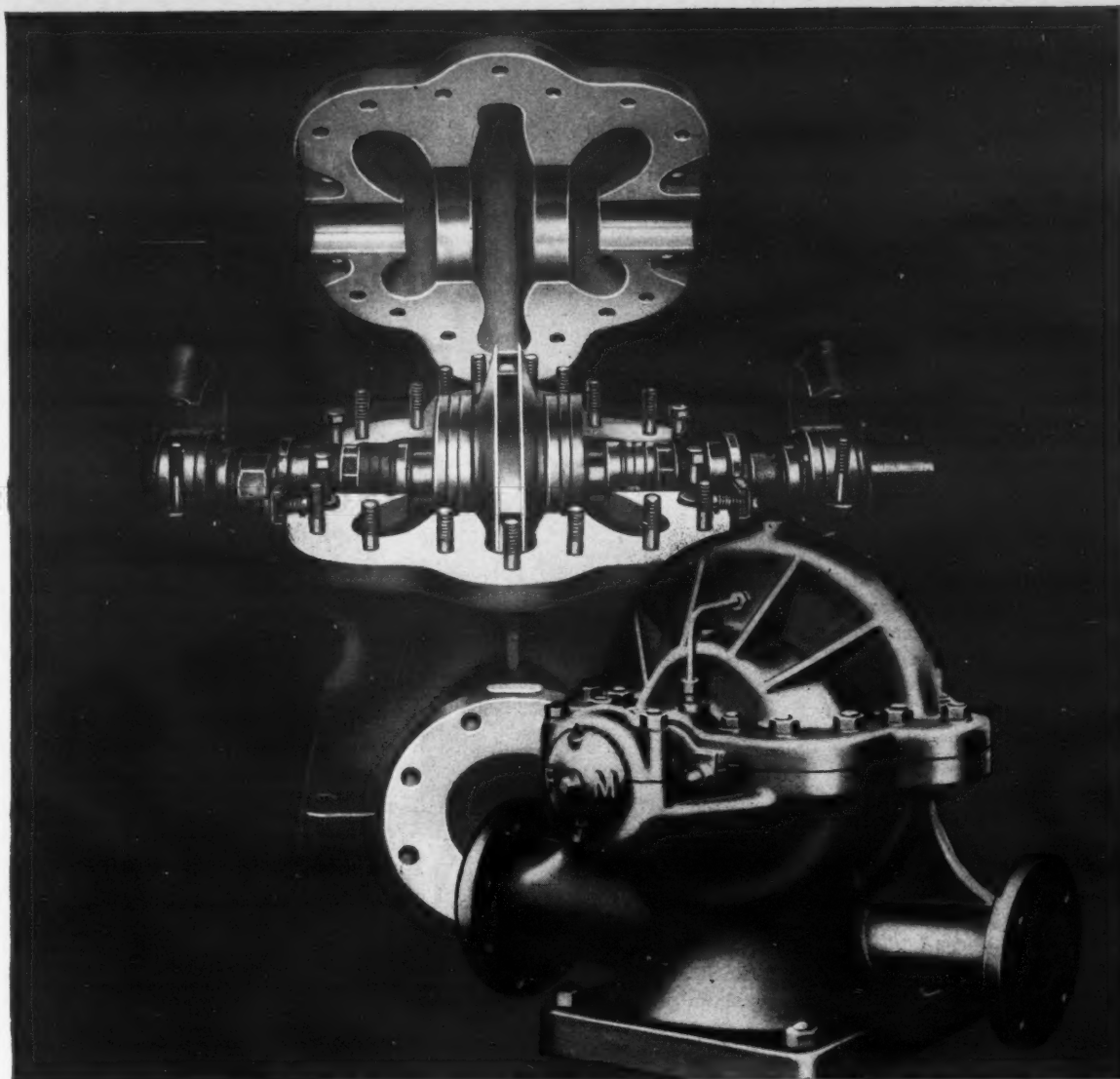
Castings for industry are described in an 8-page, 2-color bulletin. Properties and characteristics of five engineering grades of Meehanite are listed. Booklet also carries information on hardenability, section strength, and comparative properties of other cast metals. Typical applications are pictured and a table of bar and stock sizes is included.

Folder "Meehanite Castings" is available from American Brake Shoe Co., Dept. CP, 230 Park Ave., New York 17, N. Y. When inquiring specify CP 8654 on handy form, pages 2 and 3.

### Oscillographic recording systems listed in catalog

Catalog describes four, two and one channel oscillographic recording systems and accessories. Illustrations, technical data, and specifications are included in two-color, 38-page publication.

"Oscillographic Recording Systems" is issued by Industrial Div., Sanborn Co., Dept. CP, 195 Massachusetts Ave., Cambridge 39, Mass. When inquiring specify CP 8655, pages 2 and 3.



## out of the mouth of a pump...

Suppose a pump could "spill its works" . . . tell you how it was made . . . speak of the design, material, workmanship that went into its being . . . then you could know . . . and buy with confidence.

Because after all, pumps do look very much alike. How, then, to tell which make is best for you. *Reputa-*

*tion* is one way, *performance* another.

And, on both counts, Fairbanks-Morse pumps stand out. Don't take our word for it. Check with Fairbanks-Morse users. We'll stand by their verdict. For Fairbanks-Morse has only one standard . . . *quality* . . . the quality that means dependability, service, low maintenance, all

those important points that you want in the pumps you buy.

To get these advantages in your pumps, rely on the world's largest manufacturer of a complete pump line. See your nearest Fairbanks-Morse Branch, pump dealer, or write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.



## FAIRBANKS-MORSE

a name worth remembering when you want the best

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

When inquiring check CP 8656 on handy form, pgs. 2-3





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The emblem at right is that of NBP—National Business Publications. You've probably seen it before on our contents page . . . rate card . . . or heading the CHEMICAL PROCESSING listing in Standard Rate & Data. Because we're proud of it.

It signifies that CHEMICAL PROCESSING has qualified for membership in the largest association of technical, scientific and professional journals in the United States. (We're proud, too, that our C. P. executive staff includes a past president of NBP and a member of its Board of Directors.)

But belonging to NBP is more than a feather in our publishing cap. It's an important *plus* for every advertiser in CHEMICAL PROCESSING. Here are the membership requirements. Judge for yourself:

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In addition, NBP provides the framework for a continuing exchange of ideas among member publishers. The result: continuing improvement in publishing practices to make CHEMICAL PROCESSING more useful to its readers . . . more productive for its advertisers.

\* Courtesy of the publication MEDICAL ECONOMICS, creator of this copy, here adapted to CHEMICAL PROCESSING.

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For men who manage  
the Chemical Processing Industries

Published by Putman Publishing Company

Creators of PUTMAN-STYLE Magazines  
... terse, vital editorial; "hand-picked" circulation;  
square, high-visibility format; quality readership;  
hence more READER ACTION



### NEW LITERATURE

#### Handbook on temperature, pressure relief valves

Pocket-size pamphlet explains and illustrates function of relief valves, both temperature and pressure, insofar as water heaters are concerned. Subjects covered include purposes, location and installation, construction, capacity and size, pressure settings, listings and codes, and some "Do's" and "Don'ts" for valve users.

"Handbook on Temperature and Pressure Relief Valves" is issued by A. W. Cash Valve Mfg. Corp., Dept. CP, Wabash and Morgan, Decatur 60, Ill. When inquiring specify CP 8657 on handy form, pages 2 and 3.

#### Welding of nickel alloy steels

Various welding techniques, including some newer inert gas processes, electrodes, pre-heat and post-heat treatments are described in 44-page bulletin replete with tables, graphs, and illustrations. Typical results that can be expected are given for low alloy high strength steels, low carbon and medium carbon engineering alloy steels, and special steels.

Bul A-93 is available from Development and Research Div., Dept. CP, International Nickel Co., Inc., 67 Wall St., New York 5, N. Y. When inquiring specify CP 8658, pages 2 and 3.

#### How stainless steel is hardened to 2000 Brinell explained

Digest-size booklet of 61 pages describes method of hardening stainless steel to an estimated 2000 Brinell. Processor says physical qualities are unimpaired and size will vary less than 1/4 of 1/10,000 of an inch. Booklet explains method and procedures followed to prepare machined and cast stainless steel parts for this hardening process.

"Super Scottsonizing" is available from C. U. Scott & Son, Inc., Dept. CP, Rock Island, Illinois. When inquiring specify CP 8659 on handy form, pages two and three.

#### Lists data on several acrylic copolymer emulsions

General and specific data on Polycy acrylic copolymer dispersions are included in 18-page bulletin. Properties are described and tabulated. Specified uses for dispersions in leather finishes, textile finishing, paper industry, floor polishes, and paints are covered.

Bul on Acrylic Copolymer Emulsions is issued by American Polymer Co., Chemical Div., The Borden Co., Dept. CP, 101 Foster St., Peabody, Mass. When inquiring specify CP 8660 on handy form, pages 2 and 3.

**Production upped 50 to 100%  
with dispersion units**

Homogenizer-disperser machines, which emulsify, combine, grind, homogenize, refine, and blend, are described in 10-page bulletin. Machines are reported to improve product and increase production 50 to 100%.

Various models, accompanied by production capacities and specifications, are illustrated. Photographs show features and machine accessibility. Specially designed unit for paint and ink manufacture is included. Last page of bulletin has listing of approximately 350 users of the machines.

"Homogenizer-Disperser" is issued by Tri-Homo Corporation, Dept. CP, 100 Highland Avenue, Salem, Mass. When inquiring specify CP 8661 on handy form, pages 2 and 3.

**Describes labor-saving techniques  
in packaging process**

Time, effort, and labor-saving techniques made possible by application of steel strapping, wire stitching, and other special products are described in manufacturer's bulletin. Several articles discuss uses of packaging equipment in various industries. A brief section on cost cutting is included.

"Confab", Vol 5, No. 1, is issued by Acme Steel Co., Dept. CP, 2814 Archer Ave., Chicago 8, Ill. When inquiring specify CP 8662 on handy form, pages 2 and 3.

**Specs on liquid level indicators  
shown in bulletin**

Illustrated 8-page bulletin describes the operations of liquid level systems using ultrasonic pulses. Engineering application information and diagrams for typical installations in storage tanks are also included.

Bul S-68 is issued by Bogue Electric Manufacturing Co., Dept. CP, 52 Iowa Avenue, Paterson, N.J. Specify CP 8663, pages 2 and 3.

**Principles of operation, specs  
on wound rotor motors**

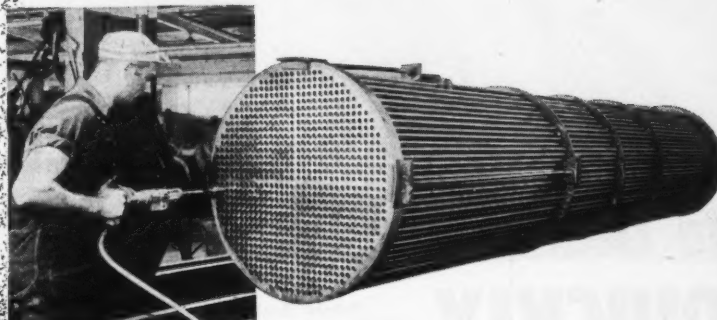
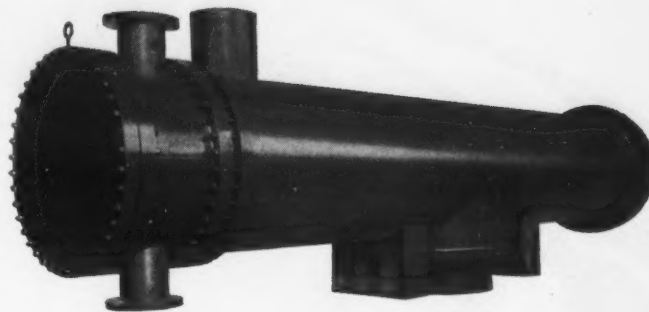
Bulletin on manufacturer's line of wound rotor motors, 1/2 to 1000 hp, covers wound rotor principles of operation and contains performance curves and characteristics that show how these units are suited to particular jobs in industry. Also outlined are construction, methods of manufacture, and various enclosures available.

Bul 1300 is available from Louis Allis Co., Dept. CP, Lou & Skid St., Milwaukee 7, Wis. When inquiring specify CP 8664, pages 2 and 3.

## Ol' man river works overtime

Putting river water to work cooling inert gas is another recent application of **p-k** special purpose, continuous flow heat exchange equipment.

685 gpm of river water at a maximum temperature of 84°F is used to cool 11,000 cfm of the gas recovered from normalizing furnaces from 900°F to 150°F. This is one of 16 identical exchangers, 36-in. shell diameter, by 18-ft. tube length, constructed in accordance with ASME standards. A maximum pressure drop of 1 lb. per sq. in. is maintained by dividing the gas flow. The unit contains approximately 3 miles of 3/4-in. cupro-nickel tubing. It is **p-k** Type E construction with full floating head and removable tube bundle—a typical example of **p-k** thermal engineering and mechanical design.



### Will standard equipment meet your needs?

**p-k** has designed and built dependable special purpose heat exchangers for years. This engineering and fabricating experience works to your advantage when you ask **p-k** for ideas on heat exchange problems. Your process may require special

equipment, but, on the other hand, standard **p-k** heat exchangers may be your answer. If you can use standard units, available in many sizes and types of shell and tube arrangements, you can save on delivery time and engineering costs.

First step is to write now for Catalog No. 12 which provides all essential engineering data on heat exchangers and other processing equipment.



**the Patterson-Kelley Co., Inc.**

750 Lackawanna Ave., East Stroudsburg, Penna.

101 Park Avenue, New York 17 • Railway Exchange Building, Chicago 4 • 1700 Walnut Street, Philadelphia • 96-A Huntington Avenue, Boston 16 • and other principal cities

When inquiring check CP 8665 on handy form, pgs. 2-3





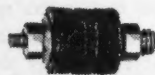
## Here's **POWER** to clean tubes from 1/2" to 2" **QUICKLY**



Expanding scraper  
and replaceable  
element.



Expanding brush  
and replaceable  
element.



Sectional wire brush.



Air valve for  
one-man operation.

Rotojet Junior Tube Cleaners are unusually powerful for their size and weight. They are fed easily through the tubes with the operating hose, and can be shifted quickly from tube to tube. Their convenient size, speed, and ease of operation offer a marked contrast with external cleaners costing many times more.

An air valve directly behind the Rotojet motor permits one-man operation. Very little headroom is required, and either vertical or horizontal tubes can be cleaned.

Simplicity of Rotojet design and precision construction assure long service, efficient use of power, and freedom from trouble. Economical brushes, cutters, and scrapers meet practically any requirement.

Send for Bulletin J-410.

# ROTOJET®

## Junior TUBE CLEANERS



**ELLIOTT COMPANY-ROTO DIVISION**

141 Sussex Avenue, Newark 1, N. J.

When inquiring check CP 8666 on handy form, pgs. 2-3

### NEW LITERATURE

#### Practical tips on vacuum pumps and systems

Dozens of practical tips on installation, operation, and maintenance of vacuum pumps and vacuum systems are contained in 16-page handbook.

Manual contains such helpful hints as: proper way to make leakproof connections in vacuum piping layouts; recommended types of gages, valves, fittings, and gaskets; troubleshooting procedures for various problems; and some 25 "Do's" and "Don'ts" to insure long and trouble-free service life of vacuum systems.

Bul 755 is available from F. J. Stokes Machine Company, Dept. CP, 5500 Tabor Road, Philadelphia 20, Pa. When inquiring specify CP 8667 on handy form, pages 2 and 3.

#### Catalog details line of tractors

Complete line of industrial material handling equipment is illustrated in 36-page catalog. Tractors, front end loaders, scrapers, graders, and industrial engines are covered in brochure.

"Presenting the Allis-Chalmers Line" is issued by Tractor Div., Allis-Chalmers Manufacturing Co., Dept. CP, 1125 S. 70th St., Milwaukee 1, Wis. When inquiring specify CP 8668 on handy form, located between pages 2 and 3.

#### Electric laboratory mantles pictured

Illustrated eight-page bulletin gives complete data on variety of electric mantles for lab use. Mantles are available for flasks of all shapes and sizes. Text stresses safety factors in use, lists capacities, power requirements, special features.

Bul No. 4A is issued by Glas-Col Apparatus Co., Inc., Dept. CP, 711 Hulman St., Terre Haute, Ind. When inquiring specify CP 8669 on handy form, pages 2 and 3.

Edward  
PRESENTS

**New ALL-PURPOSE  
STEEL VALVES**

A new all-purpose valve series, ideal for almost any service where small O. S. & Y. steel valves are used.

Drop forged steel for greatest strength... simplest packing arrangement... tight, easily accessible union or bolted bonnet joints... bronze yoke bushings... microscopically mated seats and disks... lock welded parts. Built in sizes 1/4 to 2 in. inclusive, globe or angle, screwed or socket welding ends, carbon or chromium molybdenum steels, in 600 or 1500 lbsp classes. Stocks now available.

**Bolted bonnet 1-1/4 in. up 600 lb, 1 in. up 1500 lb. Union bonnet in smaller sizes.**

For full details, dimensions, illustrations write today for your free copy of . . . **BULLETIN 501**

**Edward Valves, Inc.**

Subsidiary of ROCKWELL MANUFACTURING COMPANY  
1230 West 144th Street, EAST CHICAGO, INDIANA

When inquiring check CP 8670 on handy form, pgs. 2-3

Perforated  
STAINLESS  
STEEL

**A Specialty —  
Not a Problem  
with H & K**

**STRONG • EASILY CLEANED  
DEPENDABLY ACCURATE**

PERFORATING STAINLESS STEEL, regardless of alloy content, has long been a specialty at H & K; in fact, meeting stringent specifications for heat, corrosion, acid and alkali resistance through the years has actually made this operation a science! Stainless Steel is one of the most difficult perforating assignments — yet, H & K will satisfy your requirements with skilled accuracy and master craftsmanship.

H & K Perforated Metals are produced to your specifications in practically any sheet, coil or plate material. Whether it's Stainless or any other metal—or a non-metal such as plastics, rubber, plywood, etc. — you can be sure the job is right. Send at once for full information on your problem — recommendations and prices.

Also Remember—H & K  
Grilles . . . Ultimate in  
Beauty . . . Utility . . .  
LONG LIFE!

**The Harrington & King  
PERFORATING CO.**

5636 FILLMORE ST., CHICAGO 44, ILL.  
114 LIBERTY ST., NEW YORK 6, N. Y.

When inquiring check CP 8671 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## NEW LITERATURE

### Gooseneck booms for lift trucks

Gooseneck booms designed in dimensions and capacities to be used in conjunction with manufacturer's gas and electric fork trucks of from 1000 to 10,000 lb capacity or with Worksaver weatherized hand trucks are described in bulletin.

Used primarily for handling awkward materials which are not readily palletized, gooseneck boom is also reported useful for lifting loads over obstacles. All-welded steel unit which attaches to fork carriages for raising and lowering is easily put on or removed.

Bul 1570 describing gooseneck booms is issued by Yale Materials Handling Div., Yale & Towne Mfg. Co., Dept. CP, 11000 Roosevelt Blvd., Philadelphia, Pa. When inquiring specify CP 1672 on handy form, pages 2 and 3.

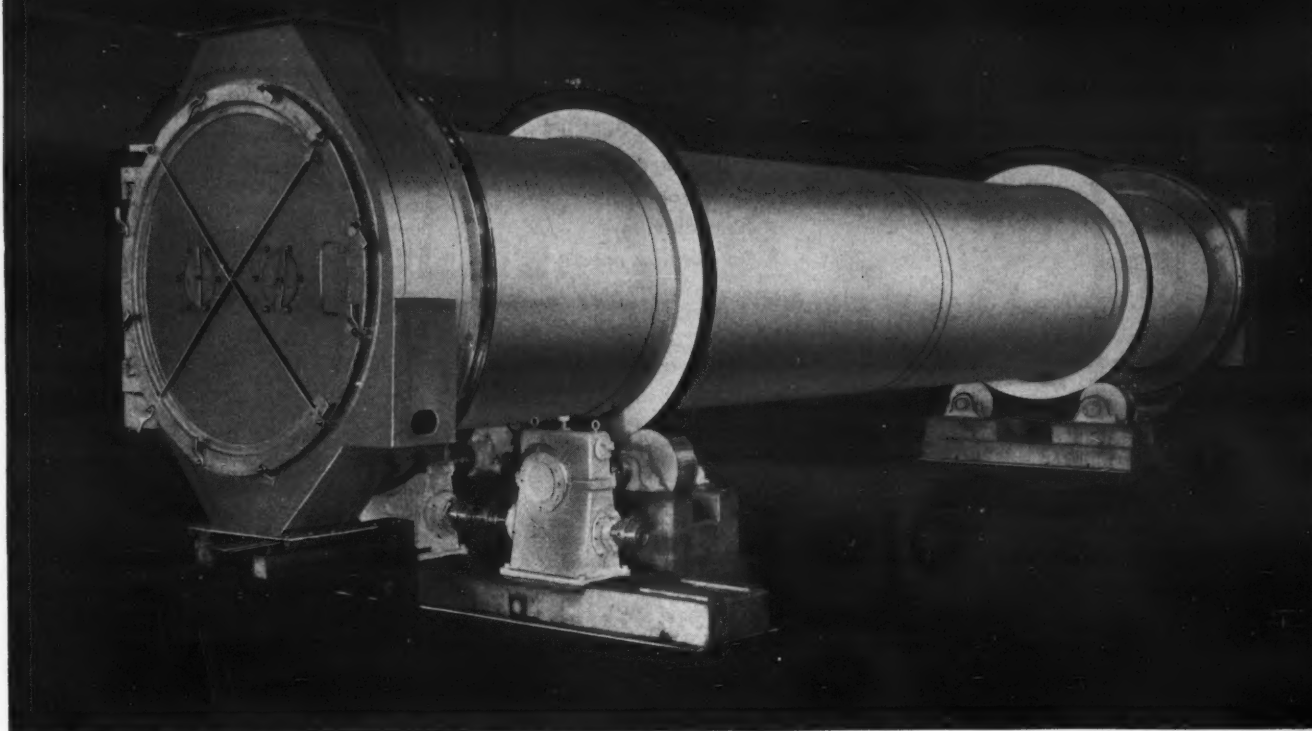
### How to obtain dust control explained in bulletin

Four-page, two-color bulletin tells how control of finely-divided dry dusts can be provided for smaller volume applications at low cost. Describing a unit cloth bag dust collector, literature points out its advantages, operation, construction, and assembly features.

Photographs show front view of two of the seven units available, and give a closeup of cloth bags supported on shaker channels. Line drawings illustrate side and front elevations of various size collectors. Pertinent data are presented in chart form.

Bul 916 is issued by the Pangborn Corp., Dept. CP, 2700 Pangborn Blvd., Hagerstown, Md. When inquiring specify CP 8673 on handy Reader Service slip which is located between pages two and three.

For more information on product at right, specify CP 8674 . . . see information request blank between pages 2 - 3.

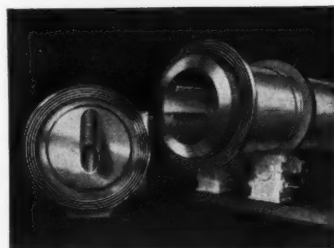


stainless steel

# Plastics Dryer

**60" x 32'0" stainless steel dryer with all interior surfaces polished to mirror finish prevents color contamination—and spoilage—between different batches of a well known plastic.**

● This is probably one of the most costly direct heat rotary dryers ever built. Even the feed and discharge breechings and inspection doors are of stainless steel. Inlet air used for drying is filtered. Discharge air is passed through a stainless steel cyclone dust collector. Fabricated in our shops, this unit typifies Bartlett-Snow's ability to design and build equipment for even the most exacting operating and service requirements.



Labyrinth Seal on 60" x 32'0" Stainless Steel Plastics Dryer showing the Mirror-like Finish on the Shell and Flights.



Special Steam Jacketed Batch Dryer showing Dustless Discharge to Screw Conveyor and Condenser where Fines are Reclaimed from Vapors.

DESIGNERS

ENGINEERS

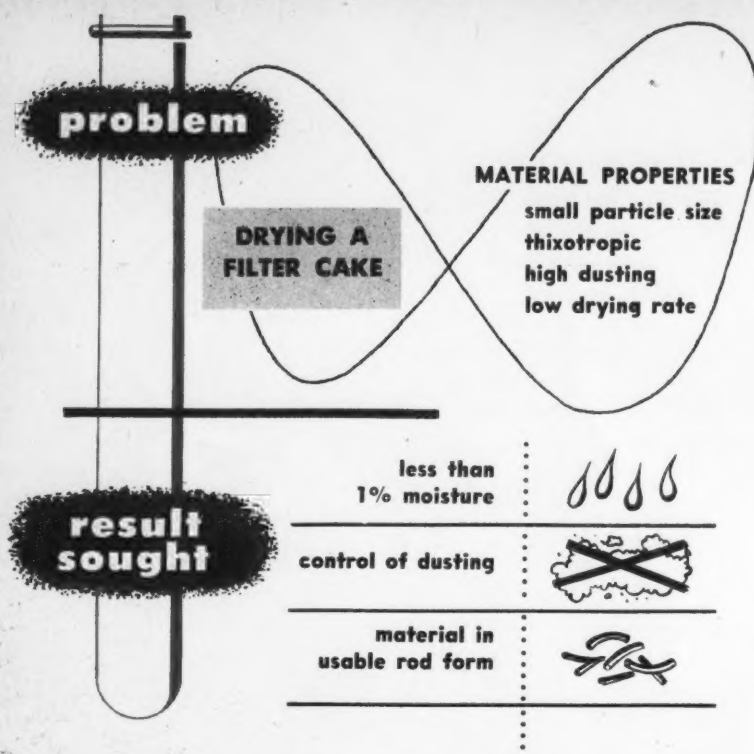
**BARTLETT  
B-SNOW**  
CLEVELAND 5, OHIO

FABRICATORS

ERECTORS

*Dryers • Coolers • Calciners • Kilns*  
"Builders of Equipment for People You Know"





## SOLUTION, THROUGH DRYING RESEARCH

To overcome the highly undesirable high-dusting quality of the material, a change in drying method alone was not the answer. Sargent engineers analyzed the pre-drying conditions — first in the field, then in the Sargent Drying Research Laboratory.

Result of this research was a special extruder, designed and built by Sargent, to form the material into anti-dusting rods with a high drying rate, and the anti-dusting quality maintained throughout the drying cycle.

Extensive drying tests in the laboratory explored every possible variable — temperature, air flow, maximum practical material bed thickness, etc. The span of high efficiency of each variable was bracketed.

In the dryer as designed, each variable could be adjusted as desired, within the bracketed span — a factor of great importance in this particular process. In production for several months, the Sargent Dryer is producing consistently, steadily, efficiently . . .

far beyond the drying rate predicted!

**Sargent  
Drying Research  
can help you.**

Write your nearest  
representative  
or write us direct.



## C. G. SARGENT'S SONS CORPORATION

INDUSTRIAL DRYERS DIVISION

Graniteville,  Massachusetts

REPRESENTATIVES: F. E. WASSON, 519 Murdock Rd., Philadelphia 19, Pa.  
A. L. MERRIFIELD, 215 Grove Ave., Cincinnati 15, Ohio  
W. S. ANDERSON, Carolina Specialty Co., Charlotte, N. C.  
HUGH WILLIAMS & CO., 47 Colborne St., Toronto 1, Canada

When inquiring check CP 8675 on handy form, pgs. 2-3

## NEW LITERATURE

### Catalogs line of industrial products from insulations to ceilings

Recent edition of 40-page catalog offers essential data on the following groups of products: insulations, refractory products, asbestos cement pipe, packings, gaskets, electrical products, frictional materials, roofing, siding, flooring, partitions, and ceilings. Photographs and diagrams supplement text which has been revised and brought up-to-date.

"Industrial Products Catalog" is available from Johns-Manville, Dept. CP, 22 East 40th St., New York 16, N. Y. When inquiring specify CP 8676 on handy form, pages 2 and 3.

### Metal processing equipment "made to measure"

Metal equipment used in chemical, plastic, rubber, textile, paper, pharmaceutical and other industries is pictured in eight-page bulletin. Available in many shapes and sizes, products can be fabricated of stainless steel, stainless clad, monel metal, aluminum, copper, copper alloys, steel, galvanized, and tin.

Photographs illustrate manufacturer's facilities and at least 30 products including cabinets, containers, hoods, kettles, pans, racks, shelving, tables, tanks, trays, mobile trucks, tubs, and vats. Maker's engineering services are outlined.

"Metal Equipment for Industrial Processing" is issued by Glasco Equipment Corp., Dept. CP, 2 Wait Street, Paterson 4, New Jersey. When inquiring specify CP 8677 on handy form, pages 2 and 3.

### Spec sheet on radiation scaler

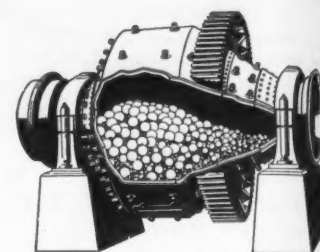
Specification sheet covers automatic radiation scaler which may be used with Geiger or scintillation counters for precise automatic measurements of radio-activity.

Spec sheet on Model 183 is issued by Nuclear-Chicago, Dept. CP, 229 W. Erie St., Chicago 10, Ill. When inquiring specify CP 8678 on handy form, pages 2 and 3.

### Lists radiochemicals and biochemicals

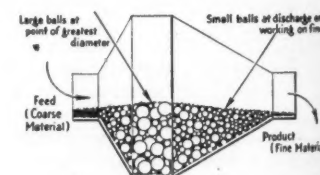
Sheet gives listing of radiochemicals and biochemicals that are commercially available from manufacturer. Many of these are of chromatographic purity.

List is available from Schwarz Laboratories, Inc., Dept. CP, 230 Washington St., Mount Vernon, N. Y. When inquiring specify CP 8679 on handy form, pages 2 and 3.



## for BALL SEGREGATION...

### Hardinge Conical Mills



The conical shape of the Hardinge Mill causes a rapid circulation and classifying action within the drum, which increases the capacity for power expended over other types. The range of grinding is large, due to the segregation of the sizes within the mill. The conical shape insures extreme rigidity and simplicity. Mechanical troubles are practically unknown. Sizes range from 2 feet to 10 feet with capacities from a few pounds per hour to 100 tons per hour. Bulletin 17-B-13 gives full details of dry grinding applications. Bulletin AH-389-13, wet grinding.

## HARDINGE COMPANY, INCORPORATED

YONKERS, NEW YORK • 240 Arch St. • Main Office and Works  
New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco

When inquiring check CP 8680  
on handy form, pgs. 2-3

CHEMICAL PROCESSING

## NEW LITERATURE

### Brochure discusses agitated kettles

Agitated kettles, including autoclaves, hydrogenators, mixers, neutralizers, polymerizers, reactors, sulfonators, and others are discussed in brochure. Materials of construction range from aluminum to stainless steel.

Literature is illustrated with photographs, engineering drawings, charts, tables and graphs. Agitation elements include turbines, propellers, anchors, and paddles. Of particular interest are pre-engineered kettles designed for economical production and fast delivery.

Brochure on agitated kettles is issued by The Colonial Iron Works Co., Dept. CP, 17643 St. Clair Avenue, Cleveland 10, Ohio. When inquiring specify CP 8681, pages 2 and 3.

### Slide chart gives data on stainless alloys

Reference data on 17 stainless and corrosion-resistant grades and 19 carbon and low alloy grades are covered in slide chart. Facts on eight heat-resistant alloys are also provided by chart. By simply adjusting guide arrow for proper grade, windows in chart reveal nominal analyses and properties of the alloy.

Circle L slide chart may be obtained from Lebanon Steel Foundry, Dept. CP, 63 Lehman St., Lebanon, Pa. When inquiring specify CP 8682 on handy form, pages 2 and 3.

### Pictures X-ray camera for five patterns

Illustrated data sheet pictures and describes an X-ray defraction camera capable of placing five X-ray diffraction patterns on one film. Data Sheet is issued by Dept. KP, Central Research Laboratories, Inc., Dept. CP, Red Wing, Minn. When inquiring specify CP 8683 on handy form, pages 2 and 3.

### Describes general purpose forced feed lubricators

Automatic lubricators, adaptable to a variety of machinery, including pumps and compressors, mills, mixers, and autoclaves, are described in 12-page notebook-size bulletin. Model 25 lubricators have individual pumping units for precise control of oil to protect wearing surfaces. Dimensions of units are also included.

Catalog 25G is issued by Manzel, Inc., Dept. CP, 315 Babcock Street, Buffalo 10, N. Y. When inquiring specify CP 8684 on handy form, pages two and three.

## This Dicalite Filter Cake is a true "Micro-Sieve"

Its openings are so small that even such micro-solids as bacteria and colloids cannot pass

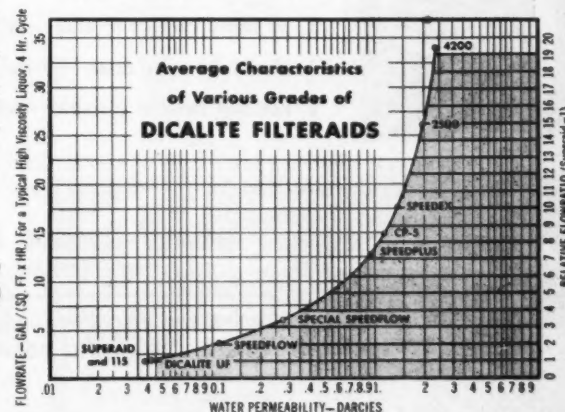
...but there are so many openings that you get fast flow through the filter.

That, in a nutshell, is the reason for both the brilliant clarity and high production achieved with Dicalite filter-aids. This efficiency is directly due to the unique structure of the diatom particles—elongated or otherwise irregular in shape. They build up in a "lattice-work" pattern which makes the filter cake a "micro-screen."

Chemically inert, sterilized in processing, Dicalite is suitable for filtering all types of liquids from acids to zein. It is used in processing hundreds of products including antibiotics, beverages, foods, metals, oils, sugars, varnishes, wines and many others.

And you can depend on Dicalite quality. Starting with the country's finest crude diatomite, all Dicalite materials are processed under a rigid system of continuous control. Write for Bulletin B-12—or a Dicalite Engineer will be glad to call and discuss a problem or any project you have in the works.

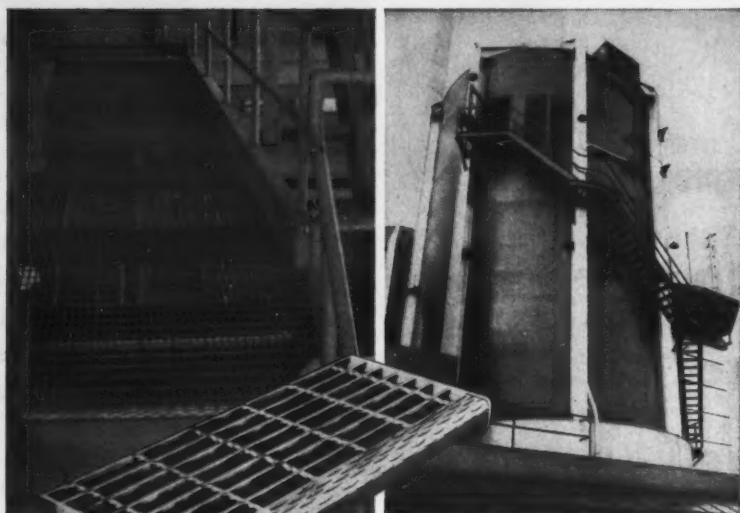
Dependable **Dicalite**  
GREAT LAKES DIATOMACEOUS MATERIALS



DICALITE DIVISION • GREAT LAKES CARBON CORPORATION, 614 SO. FLOWER STREET, LOS ANGELES 17, CALIFORNIA

When inquiring check CP 8685 on handy form, pgs. 2-3





Stair treads by BLAW-KNOX

## you can easily make every step a safe step

Indoor or outdoor, you can rely on Blaw-Knox Stair Treads to provide the safety you want in your plant.

Designed for tremendous strength against impact, these stair treads are made with twisted cross bars and rolled diamond checkered plate nosing—as illustrated.

But, when desired, you can get treads with a twisted cross bar nosing or an abrasive nosing. And for specially slippery conditions we can supply you with serrated cross bar treads.

Just tell us what your application is and we'll offer our recommendations as to the best type of tread for your job.

### Only Blaw-Knox Electroformed®

#### Steel Grating and Stair Treads

—have these five exclusive features:



1. rigid one-piece construction—easy to install
2. all surfaces accessible—easy to paint
3. no sharp corners to clog—self-cleaning
4. maximum open area—for light and ventilation
5. non-slip twisted crossbar—safe footing

A short note will bring you a copy of new Bulletin No. 2365-R  
—a dimensional sketch will bring you a quotation.

**BLAW-KNOX**

### BLAW-KNOX COMPANY

2076 Farmers Bank Building • Pittsburgh 22, Pa.

BLAW-KNOX EQUIPMENT DIVISION  
GRATING DEPARTMENT

GRATING APPLICATIONS: floors • platforms • walkways • catwalks • stair treads • fan guards • shelving • and many other uses, both outdoors and indoors, for versatile steel grating.

When inquiring check CP 8686 on handy form, pgs. 2-3

### NEW LITERATURE

#### Remotely controlled valve features described

Advantages of line of remotely controlled,  $\frac{3}{4}$ " pilot operated, 4-way valves for industrial use are explained in 6-page folder. Valves have a pressure range from 100 to 5000 psi. Specifications and installation data are included for the three basic models available — spring offset, no spring, and spring centered.

Bul 57 is available from Hydraulic Div., Pantex Mfg. Corp., Dept. CP, Pawtucket, R. I. When inquiring specify CP 8687 on handy form, pages two and three.

#### Gives technical data on coated fabrics

Technical data on a wide variety of industrial coated fabrics for diverse applications are listed in five-page catalog. Recommended uses and specifications are given for each fabric. Materials include Buna N-coated nylon, neoprene-coated cotton, neoprene-coated fiberglass, and general purpose coated fabrics.

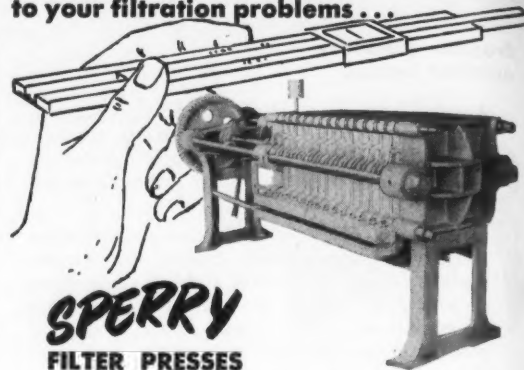
"Industrial Coated Fabrics" is issued on letterhead request to Mechanical Products Div., Haartz-Mason, Inc., Dept. CP, Watertown 72, Mass.

#### Steel-reinforced flooring outlives plant

Uses and advantages of steel-reinforced flooring are described in two-color bulletin. Reported to outlive the plant itself, flooring is especially designed for trucking aisles, loading docks, and other areas subjected to materials handling equipment and severe abuse. Product may be used on interior or exterior surfaces of concrete or wood.

Bul on Steel-Rock Flooring is available from United Laboratories, Inc., Dept. CP, 16801 Euclid Ave., Cleveland 12, Ohio. When inquiring specify CP 8688 on handy form, located between pages 2 and 3.

for the exacting answers  
to your filtration problems...



## SPERRY FILTER PRESSES

When you consider the many advantages of Sperry Filter Presses, you can quickly understand why hundreds of manufacturers throughout the country depend on Sperry for solving industrial filtration problems of every kind.

Sperry Filter Presses offer greater economy—low first cost, minimum maintenance and long life... require less floor space... handle any kind of filterable mixture... and use practically any kind of filter material. For the complete story, ask for the big free Sperry catalog.

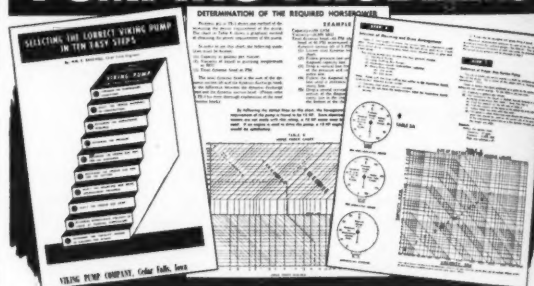
### D. R. SPERRY & CO. BATAVIA, ILLINOIS

Filtration Engineers for More Than 60 Years

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Western Sales Representative: B. M. Pilhashy, 833 Merchants Exchange, San Francisco, 4, California DO 2-0375

When inquiring check CP 8689 on handy form, pgs. 2-3

## HERE'S MORE INFORMATION TO HELP YOU UNDERSTAND YOUR PUMPING PROBLEMS



"Selecting the Correct Viking Pump in Ten Easy Steps," is a ten-page booklet designed to help engineers in choosing the right Viking Pump for each application. This folder is free upon request.



If you would like to have one or more copies, write today for Bulletin TS-6CC.

**VIKING PUMP COMPANY**  
CEDAR FALLS, IOWA

When inquiring check CP 8690 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## NEW LITERATURE

### Describes sequestering, antioxidantizing, and emulsion stabilizing agent

Teac-90, which is used as a liquid sequestering agent, an emulsion stabilizer, and as an antioxidant, is described in three notebook-size sheets. Many applications are given for the compound, an organic salt derived from selected acids and amines. Material is effective in acid media, and stable on storage.

Bul 1-54 is issued by Process Chemical Specialties, Dept. CP, PO Box 345, Beverly, Mass. When inquiring specify CP 8691 on handy form, pages 2 and 3.

### Better corrugated packaging emphasized in quarterly

Articles of interest to those concerned with better corrugated packaging are presented in quarterly bulletin. Documentary photo-stories are shown. Factual articles tell how particular packaging problems were solved. Details concerning specific savings in time, labor, material and freight costs are outlined.

January 1954 issue of "Package Laboratory News" is available from Hinde & Dauch Paper Co., Dept. CP, 5103 Decatur St., Sandusky, Ohio. When inquiring specify CP 8692 on handy form, pages 2 and 3.

### Bulletin describes thermometers and accessories

Line of dial thermometers is completely described with detailed specifications in 8-page, 2-color bulletin.

Dial Thermometer Bulletin is issued by Rochester Manufacturing Co., Dept. CP, 100 Rockwood St., Rochester 10, N. Y. When inquiring specify CP 8693 on handy form, pages 2 and 3.

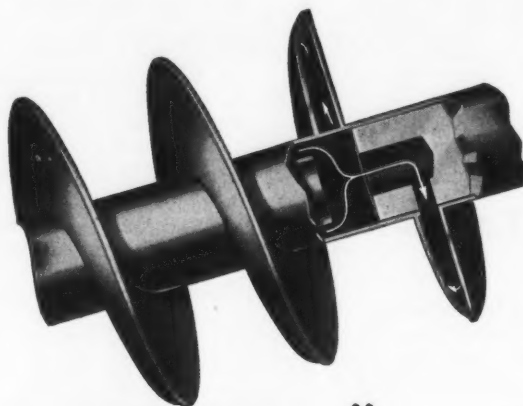
### Pictures one-piece, lightweight pipe insulation

Lightweight, one-piece pipe insulation is topic of four-page, three-color bulletin. Description of ease of application is accompanied by photographs. Thermal resistance, permanence, resiliency, non-corrosive properties are described.

Additional information includes a chart indicating thermal efficiency, a suggested specification form, an insulation thickness selection table, and a table showing available sizes and thicknesses.

Bulletin on Mono-Kover is issued by Baldwin-Hill Company, Dept. CP, 500 Breunig Avenue, Trenton 2, New Jersey. When inquiring specify CP 8694 on handy form, pages 2 and 3.

## A great new advancement in heat exchangers...



## THE holo-flite PROCESSOR (HOLLOW-FLITE)

### A simpler, more compact way to cool slurries, solids or pastes—in continuous flow!

Do you have processes where slurries, solids, pulps or pastes must be cooled or cooked? Do you know you can now handle such processes—in continuous flow—in as little as 1/5th the space required by other types of heat exchangers—and with many other important advantages?

### The newly-developed HOLO-FLITE Processor is the answer!



## what IT IS!

Basically the HOLO-FLITE consists of two or more flights of hollow-bladed screw conveyors. The product to be processed moves in a trough around the conveyor screws. The heat-transfer fluid circulates through the hollow blades and shafts of the conveyor. The product is constantly rotated into, around, under and over the blades and shafts through which the heat-transfer fluid is circulating, assuring quick, uniform heat passage between the two mediums—as the product is continuously moved along in a bulk-flow without interruptions!

Get the complete story on HOLO-FLITE savings and how this new advancement can simplify your processing operations. It is backed by the same organization that pioneered COTTRELL Precipitators and MULTICLONE Collectors—your assurance of complete dependability.

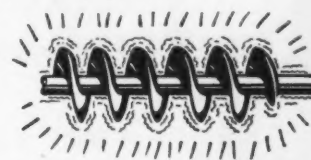
\*Reg. T.M.



DETAILED INFORMATION! New 8 page bulletin describing HOLO-FLITE features and applications will gladly be sent on request. Write, wire or phone for your free copy!

## why IT'S BETTER!

The HOLO-FLITE principle provides many important advantages in modern processing operations...



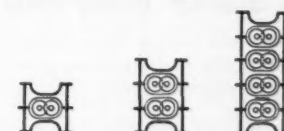
ITS LARGE HEAT-TRANSFER SURFACE requires far less space—as little as 1/5th the space required by other heat-exchange equipment. Further, flights can be "stacked" as high as desired to save floor space, simplify installation!



ITS SLOW ROTATION IS SO GENTLE that granular and powdered solids are handled with no dusting—little or no particle abrasion. Result—no dust recovery problems... simple, inexpensive installation.



IT IS ADAPTABLE to a wide range of applications—handles solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, water or other fluids to provide a wide range of temperatures. Cooled products can be packed directly from HOLO-FLITE discharge, saving time, space and additional handling.



IT CAN BE DESIGNED to handle virtually any capacity by varying the diameter and length of the flights, and the number of "tiers."

## WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUORS

Main Offices: 1023 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA  
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PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

When inquiring check CP 8695 on handy form, pgs. 2-3





**Is your primer  
the WEAK LINK  
in your  
corrosion protection?**

Experience proves that the finest protective coatings available fail when applied over an inadequate primer. Inexpensive "cure-all" primers which permit the top finish coat to peel, split or chip off, obviously reduce the expected life of the protection.

## RUSTBOND Primer

**will make your protective coatings  
last longer!  
by providing**

### ► INCREASING BONDING STRENGTH

Rustbond's surface adherence actually improves with age. Through controlled polymerization, it acquires progressively stronger adhesion to wire-brushed steel surfaces, assures a strong top finish bond.



### ► SHARP EDGE PROTECTION

Rustbond's high polarity insures a uniformly thick coating even to sharp edges, providing maximum protection where the corrosive action is hardest to check.



**Other RUSTBOND benefits  
that mean longer-lasting protec-  
tive coating jobs for you!**

- Easy to apply—just brush on. No two-part mixing.
- Wets rusty steel . . . finish coats do not strip.
- Resists dry heat up to 350°F.
- Eliminates "tiecoats" for top finishes.
- Reduces creep under damaged coatings.



**WRITE TODAY**  
for four-color  
bulletin showing  
comparative  
Primer Tests and  
further details on  
Rustbond  
Primer.

**carboline  
C O M P A N Y**

A Division of Mullins  
Non-Ferrous Castings Corporation

**Specialists  
in Corrosion Resisting  
Synthetic Materials**

333 Thornton Ave., St. Louis 19, Mo.

When inquiring check CP 8696 on handy form, pgs. 2-3

## NEW LITERATURE

### Catalogs properties of chemical line

More than 80 products, comprising commercial, semi-commercial, and laboratory chemicals offered by manufacturer, are described in two-color 8-page catalog. Principal physical properties are given.

Cat 54-1 is issued by Sharples Chemicals Inc., Dept. CP, 1100 Widener Bldg., Philadelphia 7, Pa. When inquiring specify CP 8697 on handy form, pages 2 and 3.

### O-ring "spiral twist" eliminated

Four-lipped rubber seal that resists spiral twist is described in six-page bulletin. Literature details applications, engineering features, and characteristics of Quad Ring. Cross-section drawings of ring under various pressures are shown. Charts show comparison of seal with rubber O-rings. Typical installations are given and complete listings of all available sizes, dash numbers, and tolerance variables are included.

Bulletin on Quad-Rings is issued by Dept. KP, Minnesota Rubber & Gasket Co., Dept. CP, 3630 Wooddale Ave., Minneapolis 16, Minn. When inquiring specify CP 8698 on handy Reader Service slip located between pages 2 and 3.

### Shows properties of cast plastic sheet

Applications of clear cast thermoset plastic sheets are described and illustrated in 12-page catalog. Properties such as high abrasion and heat resistance, toughness and solvent resistance are featured. Technical properties and fabrication data are included.

"Cast Thermoset Plastic Sheets" is issued by Cast Optics Corp., Dept. CP, Riverside, Conn. When inquiring specify CP 8699 on handy Reader Service slip located between pages 2 and 3.

**DRIBBLING  
IN BASKETBALL  
IS OK...**



**BUT NOT IN A  
FERTILIZER  
PLANT**



• A good dribbler may be worth his weight in gold . . . in basketball, but in your plant, dribbling expensive granular fines through poor fitting bucket lips can result in costly contamination.

Blaw-Knox Chemical and Fertilizer Buckets are designed with *tight-fitting* lips to prevent leakage. They stop the dribbling away of your profits. These cast alloy steel lips also resist abrasion and prolong bucket life.

For a detailed description of the important features in Blaw-Knox Buckets, write for Bulletin 2378 today.

**BLAW-KNOX**

**BLAW-KNOX COMPANY  
BLAW-KNOX EQUIPMENT DIVISION  
Dept. 761 • Pittsburgh 38, Pa.  
Offices in Principal Cities**

**BLAW-KNOX CLAMSHELL BUCKETS  
FOR THE CHEMICAL INDUSTRY**

When inquiring check CP 8700 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## NEW LITERATURE

### Tilting U-tube flow meter described in catalog

Catalog offers pertinent data including description of operating principle, easy method of calibration and convenient range change feature. Close-up photographs are used to illustrate inside and outside of meter. Complete information is given on capacities, pressures, and materials of construction. Separate section includes drawing with dimensions and suggested installation method.

Cat 1027 is issued by Penn Industrial Instrument Corp., Dept. CP, 4110 Haverford Ave., Philadelphia 4, Pa. Specify CP 8701, pages 2 and 3.

### Diaphragm motor valves described in catalog

Line of diaphragm motor valves for on-off or narrow-band proportional control is described in 12-page catalog.

Bul 362 is issued by Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne and Windrim Aves., Station 64, Philadelphia 44, Pa. Specify CP 8702, pages 2 and 3.

### How to choose and use surface-active agents

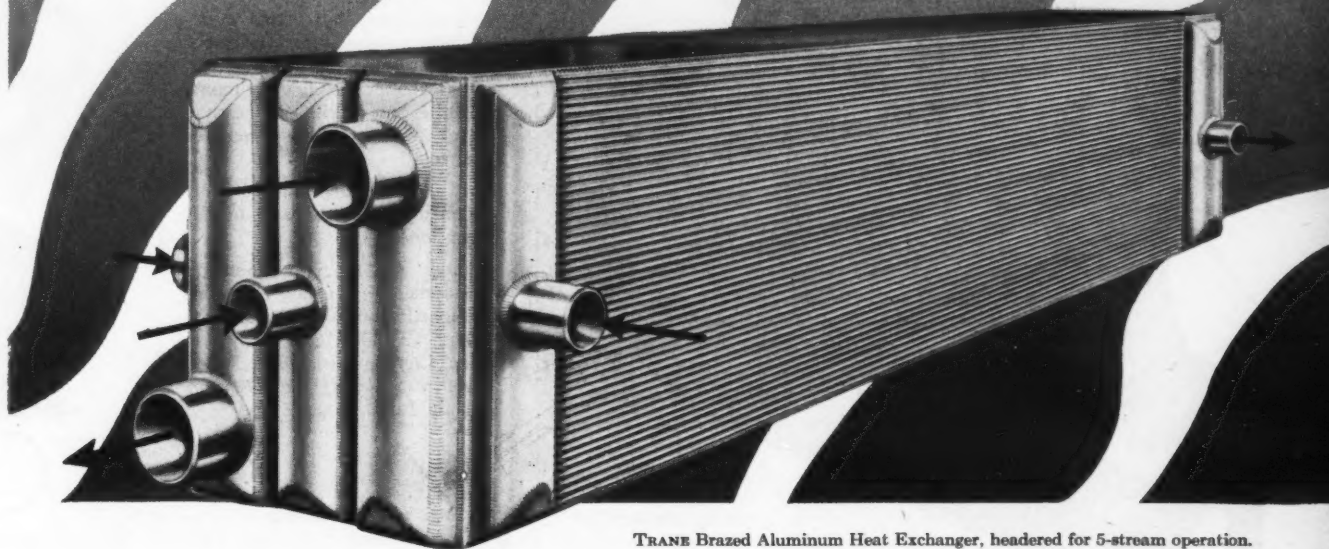
Chemical and physical properties of manufacturer's line of cationic and non-ionic surface-active agents are given in two-color notebook-size bulletin of 21 pages. Presented in detailed graphical tabulations are solubility data, emulsifying characteristics with a variety of oils and water, and industrial applications.

Information and suggested formulations for wax, mineral oil, and insecticide and herbicide emulsions, paint strippers, wool lubricants, water-repellents, and other applications are included.

"Ethofats, Ethomids, Ethomeens" is issued by Chemical Division, Armour and Co., Dept. CP, 1355 W. 31st St., Chicago 9, Illinois. Specify CP 8703, pages 2 and 3.

# 5 passes... 5 gases...

*with just one Trane heat exchanger*



TRANE Brazed Aluminum Heat Exchanger, headered for 5-stream operation.

## Multi-fluid heat exchanger for large scale process heat transfer saves space, saves cost

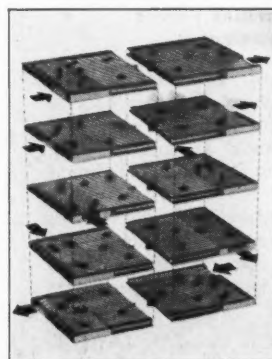
The problem of heat transfer between three, four, five or more liquids or gases in process operation can be solved by lighter, more compact, more economical TRANE Brazed Aluminum Heat Exchangers. One multiple-stream TRANE unit has in many instances occupied  $\frac{1}{4}$  the space at  $\frac{1}{4}$  the weight of conventional heat exchangers, at far less cost . . . making it particularly well suited for processes using multi-stream heat

transfer, such as air separation, helium and ethylene recovery. The reason . . .

**More efficient heat exchange surface** of TRANE brazed aluminum gives you a lighter weight heat exchanger that packs up to 450 sq. ft. of heat transfer surface into one cubic foot, yet operates at pressures up to 500 psig with temperatures as low as  $-350^{\circ}$  F.

**Whether your heat exchange problem** involves close temperature approach, low temperatures or multi-fluid heat transfer, there is a TRANE Brazed Aluminum Heat Exchanger to fit your needs. Our 30 years' experience in all phases of heat transfer plus our laboratory facilities provide the solution to these problems.

**For further information**, ask your TRANE Sales Office for a copy of "Extended Surface Heat Transfer Equipment" or write TRANE, La Crosse, Wisconsin.



This symbolic drawing shows how one TRANE Brazed Aluminum Heat Exchanger can handle as many as five fluids simultaneously. Compact design simplifies headering. Units are available for cross-flow and counter-flow operation.

# TRANE

*brazed aluminum  
heat transfer surfaces*

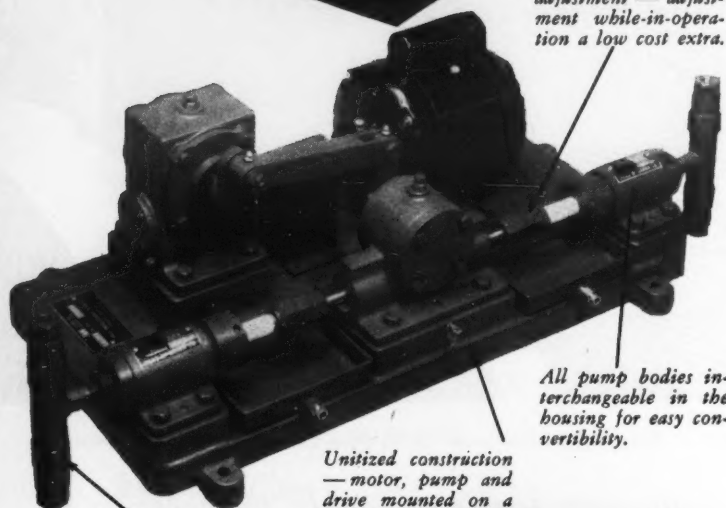
MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING, VENTILATING AND HEAT TRANSFER EQUIPMENT

The Trane Company, La Crosse, Wis. • East. Mfg. Div., Scranton, Penn. • Trane Co. of Canada, Ltd., Toronto • 87 U.S. and 14 Canadian Offices



**Can your proportioning pumps match this for convenience and versatility?**

*Easy, precise stroke adjustment — adjustment while-in-operation a low cost extra.*



*All pump bodies interchangeable in the housing for easy convertibility.*

*Unitized construction — motor, pump and drive mounted on a common base.*

*Separate, interchangeable external check valves for easy dismantling or replacement.*

**HILLS-McCANNNA  
"U" TYPE  
PROPORTIONING PUMPS**

Hills-McCanna "U" Type Proportioning pumps combine precision operation with high standards of convenience and versatility not ordinarily associated with pumps of this type. The "U" pump is easy to install and can be converted quickly and economically for changing service requirements.

If you must continuously meter or proportion small volume flows with great accuracy, it will pay you to consider a Hills-McCanna "U" Type Pump. Capacities range from 0.10 to 24 gph per feed, 1, 2, 3 and 4 feed units are available.

Write for Catalog UP-54. HILLS-McCANNNA CO., 2370 W. Nelson St., Chicago 18, Ill.

**HILLS-McCANNNA**

*metering and proportioning pumps*

Also Manufacturers of:

SAUNDERS TYPE DIAPHRAGM VALVES  
FORCE FEED LUBRICATORS • MAGNESIUM SAND ALLOY CASTINGS

When inquiring check CP 8704 on handy form, pgs. 2-3

## NEW LITERATURE

### Describes crystallizers, evaporators

Line of exchangers, evaporators, crystallizers, and other tubular equipment is featured in four-page folder, along with engineering drawings and tables.

Photographs show such products as a stainless vacuum vapor condenser, carbon steel reboiler, solid monel evaporator, monel bundles and shells with carbon steel channels, and a nickel-clad reactor.

In addition to standard line, company's custom-made line is mentioned.

Folder on tubular processing equipment is issued by The Colonial Iron Works Company, Dept. CP, 17643 St. Clair Avenue, Cleveland 10, Ohio. When inquiring specify CP 8705 on handy form, pages 2 and 3.

### Presents water-soluble grease solvent

Physical properties, specifications, shipping data, and uses of water-soluble grease solvent are discussed in Bul F-8291, available from Carbide & Carbon Chemicals Co., a division of Union Carbide & Carbon Corp., Dept. CP, 30 East 42nd St., New York 17, N. Y. When inquiring specify CP 8706 on handy form, pages two and three.

### Lists, describes valves for fluid control

Illustrated two-color catalog of 48 pages describes control valves for use with variety of fluids such as air, alcohol, fuel, fuming nitric acid, liquid oxygen, hydrogen peroxide, and hydraulic fluid. Valves are magnetic, solenoid, and pressure-operated. Flow curves and complete specifications are included.

Cat 200 is issued by Dept. T, Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., Dept. CP, Bridgeport 1, Conn. When inquiring specify CP 8707, pages 2 and 3.

## FREE TRIAL OFFER NO STRINGS ATTACHED



**A VALUABLE KIT**  
Caron contains 6 grades of ultra-fine quality, assorted fine grit abrasive compounds suitable for a variety of work. Coarser grit compound can also be supplied.

**6  
LIBERAL JARS  
DIFFERENT  
GRADES**

### FOR MAINTENANCE LAPPING

Here's a get-acquainted offer you can't afford to miss. Hard and soft abrasives that can be used in the maintenance of all types of processing equipment. Sent postpaid anywhere in the U.S. and Canada.

No obligation—write today on your company letterhead.

**PROVE THEM AT OUR EXPENSE!**

**UNITED STATES PRODUCTS CO.**

515 MILLWOOD ST.



PITTSBURGH, PA.

When inquiring check CP 8708 on handy form, pgs. 2-3



**with Twin Disc HYDRO-SHEAVE® Drives**

In thousands of diversified applications the HYDRO-SHEAVE Drive, slipped on the end of motor shaft, permits smoother acceleration — eliminates motor stalls and burnouts. Sizes for motors and engines from 1/4 to 50 hp.

Only HYDRO-SHEAVE Drives provide exclusive Double-Circuit fluid coupling design for full torque output, maximum shock absorption, less overall diameter with greater capacity.



When inquiring check CP 8709 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## NEW LITERATURE

### Shows moisture instrument using carbide

A moisture tester employing calcium carbide to generate acetylene gas is shown in two-color, four-page bulletin. Directions for use, suggested sampling and comparative test results are included. Tester is designed for use with granular or fibrous materials such as coal, powders, resins, etc.

"Olivo Moisture Meter" is issued by Heyl & Patterson, Inc., Dept. CP, 55 Fort Pitt Blvd., Pittsburgh 22, Pa. When inquiring specify CP 8710 on handy form, pages 2 and 3.

### Surface preparation and painting subject of manual

Volume one of "Steel Structures Painting Manual" describes current surface preparation and painting practices in various industries. This volume is the first of two on good painting practice. Material is written from viewpoint of paint users. Book contains eighteen chapters plus a forward, glossary, and index. It is a practical encyclopedia of economical and satisfactory painting methods, rather than a technical treatise on paint formulation.

Volume one of "Steel Structures Painting Manual" is available for \$6.00 from Steel Structures Painting Council, Dept. CP, 4400 Fifth Ave., Pittsburgh 13, Pa.

### Better laboratory planning

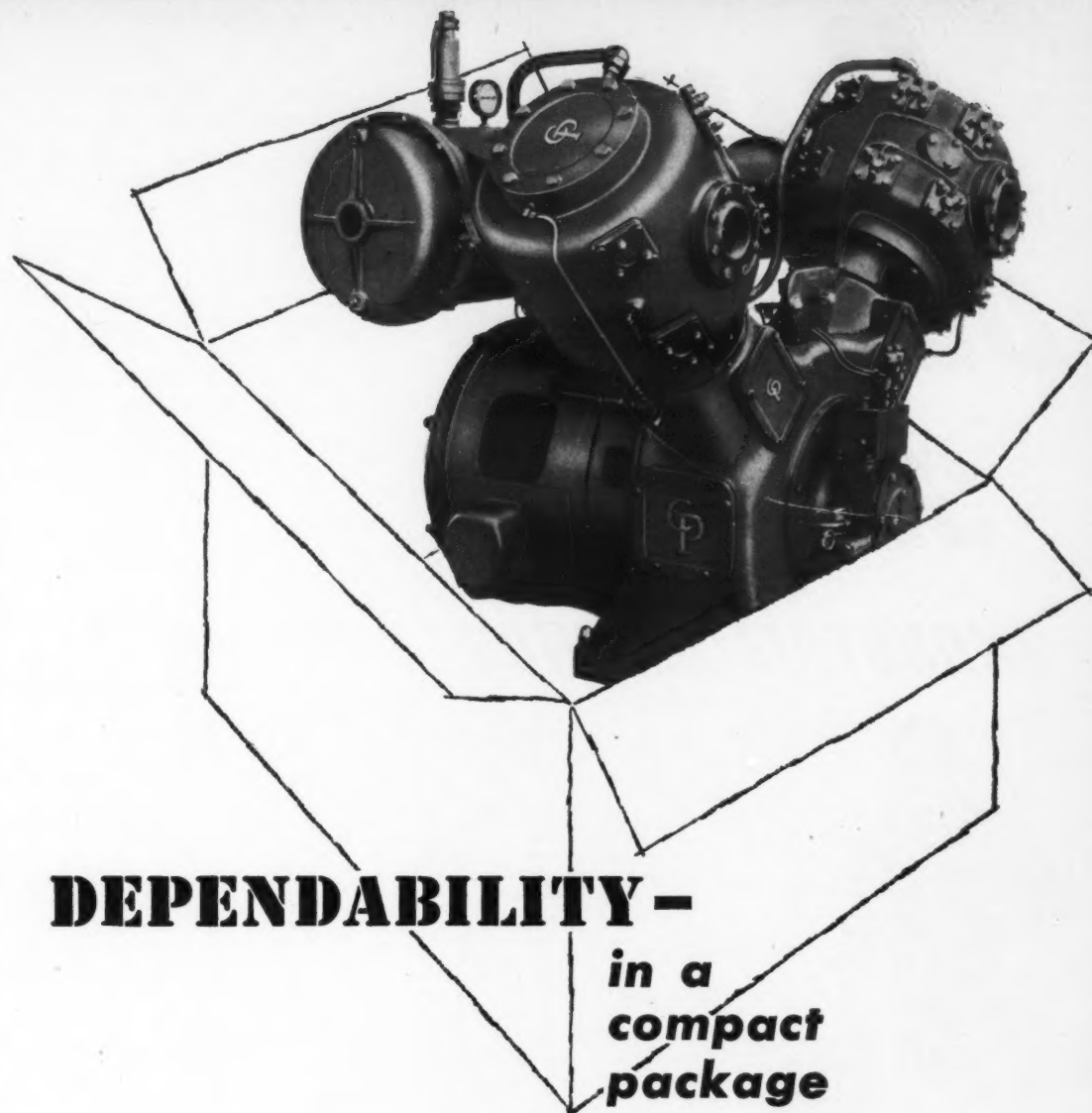
Illustrated, 28-page booklet shows many laboratory interiors and gives practical suggestions and hints for laboratory layout. In addition to general information, booklet discusses specifications, purchasing, and recommended bidding procedure.

Revised edition of "Better Laboratory Planning" is issued by Laboratory Equipment Section, Scientific Apparatus Makers Association, Dept. CP, 20 N. Wacker Drive, Chicago 6, Ill. When inquiring specify CP 8711, pages 2 and 3.

### Engineering properties of "S" Monel

Seven-page technical booklet describes the engineering properties of "S" Monel. This is an age-hardenable casting alloy that provides unusual strength, hardness, and anti-galling properties at temperatures up to 1100°F.

Bul 2795 is issued by Development & Research Div., International Nickel Co. Inc., Dept. CP, 67 Wall St., New York 5, N. Y. When inquiring specify CP 8712, pages 2 and 3.



**DEPENDABILITY -**  
**in a**  
**compact**  
**package**

With floor space at a premium, CP's space-saving Type Y Compressor is the answer! Shipped as a package ready for easy installation on a simple, inexpensive foundation, the dependable Type Y is designed for continuous operation and long life with high efficiency. Location of air inlet and discharge openings on cylinders permits the simplest and most compact piping arrangement. The "Y" arrangement also provides maximum accessibility to cylinders and to the easy-to-clean, easy-to-maintain shell-and-tube intercooler.

The Type Y has roller main bearings, precision connecting rod bearings, and multi-step capacity regulation. Available from 75 to 250 hp; 410 to 1663 c.f.m. capacity, and in single or multi-stage designs for a wide range of pressures. *Chicago Pneumatic Tool Co., 8 East 44th St., N. Y. 17, N. Y.*



**Chicago Pneumatic**

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

When inquiring check CP 8713 on handy form, pgs. 2-3



# Pump- don't slop

## INDUSTRIAL LIQUIDS



Delivers on both back and forward strokes.

Alternate materials are available for special liquids.

You can build an effective barrier against fires and accidents, reduce maintenance costs and make a general improvement in housekeeping if you pump liquids from drums instead of pouring, drawing, siphoning or spigoting. If you use Tokheim pumps you may also be rewarded with lower insurance rates.

The wisdom of pumping seems obvious, doesn't it? And so desirable you'd think every factory would have such equipment. But the number of modern plants that still employ antiquated methods of liquid transfer is surprising.

These little Tokheim pumps are a valuable asset to any factory. They assure safe handling of liquids in small quantities—reduce spilling, slopping, over-filling, dripping, and practically eliminate slippery floors. Pump 20 gallons a minute. Available with hose or spout and optional parts for special liquids. Decide now to put Tokheims to work for you. See your dealer, your Tokheim representative, or write the factory.

**QUALITY**  
**TOKHEIM**  
DOUBLE-ACTION  
HAND PUMPS

General Products Division  
**TOKHEIM CORPORATION**  
Designers and Builders of Superior Equipment  
1690 Wabash Ave. Since 1901 Fort Wayne 1, Ind.  
Factory Branch: 1309 Howard St., San Francisco 3, California  
Canadian Distributor: H. Reeder, 205 Yonge St., Toronto, Ont.

Gasoline Pumps and Accessories • Air and Liquid Dispensers • Specially Engineered Products

When inquiring check CP 8714 on handy form, pgs. 2-3

### NEW LITERATURE

#### Technical data sheets on DOP and DIOP

Properties and uses of dioctyl phthalate (DOP) and diisooctyl phthalate (DIOP) are individually described in two technical data bulletins. Both compounds find application as a primary plasticizer for vinyl resins. Specific performance data of each are enumerated.

Bul E-6 on DOP and Bul E-7 on DIOP are issued by Witco Chemical Co., Dept. CP, 260 Madison Ave., New York 16, N. Y. When inquiring specify CP 8715 on handy form, pages 2 and 3.

#### Determine % hydrogen in hydrocarbons

Bulletin illustrates hydrogen analyzer which continuously analyzes, controls, and records concentrations of gas in mixtures with air or hydrocarbons. Diagram shows principle of operation. Complete specifications are given.

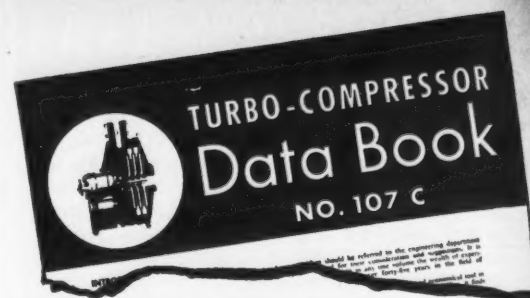
Bul 301 is issued by Taller & Cooper, Inc., Dept. CP, 75 Front St., Brooklyn 1, N.Y. When inquiring specify CP 8716 on handy form, pages two and three.

#### Uses of electric heat outlined

Principal industrial electric heating applications and methods are described in a 32-page booklet. Illustrated case histories show ways to apply metal-sheathed electric heating units in several industrial jobs. Physical aspects of installation are shown along with a description of problem, solution, and advantages obtained.

A section is devoted to far-infrared heating, showing 28 typical uses for this method.

"101 Ways to Apply Electric Heat" is issued by Edwin L. Wiegand Company, Dept. CP, 7517 Thomas Blvd., Pittsburgh 8, Pa. When inquiring specify CP 8717 on handy form, pages two and three.



### Have You Considered Air for the Following Uses?

**AIR CURTAINS... LIQUID REMOVING  
HEAT TREATING... SCALE BLOWING  
COOLING... SPRAYING... AGITATION  
TESTING... DRYING... VENTILATING  
HEAT TREATING**

These and other applications are described in the Spencer Turbo-Compressor Data Book No. 107-C. Yours for the asking.



When inquiring check CP 8718 on handy form, pgs. 2-3

## GASKETS • SHIMS WASHERS

**From 1 to 1 Million**

No matter what type, thickness, shape or quantity required, you can count on Chicago-Wilcox for uniformly accurate gaskets, shims, washers or special stampings.

With 50 years accumulation of dies, chances are we can furnish just what you need without a die charge—thus reducing costs substantially and assuring on-schedule delivery.

Gaskets, shims and washers can be supplied in metallic, non-metallic and plastics... teflon, nylon, etc. . . and in quantities to meet your production requirements.

Write for catalog and submit your specifications for quotation.

**CHICAGO-WILCOX MFG. CO.**  
7701 South Avalon,  
Chicago 19, Illinois

When inquiring check CP 8719 on handy form, pgs. 2-3

CHEMICAL PROCESSING

## Our Industry's Story

(Continued from page 5)

large percentage of them felt the industry should do more to tell the general public about itself.

We should inform the public in our own long-range self interest. We should inform them because we want people to find lifetime employment in our industry — because we want more people to invest in chemical companies. We should inform them because we want them to understand our problems such as the question of tariffs, of special taxes, the pollution situation. We want the public to understand our position on public matters. If they don't have information on which to base an opinion, there will be no reason for them to give us their support. Many member companies of MCA and other companies in the industry are doing an excellent job in telling the industry story on an individual basis. I feel that every company in the industry should make at least some small effort in this direction.

The problem that confronts us here, however, is brought about by the dynamic status of our industry. It has been growing so quickly, and fanning out so widely with a diverse range of products and interests that the public — even the best informed members of the public — have difficulty in comprehending the importance of the chemical industry to the life of the individual.

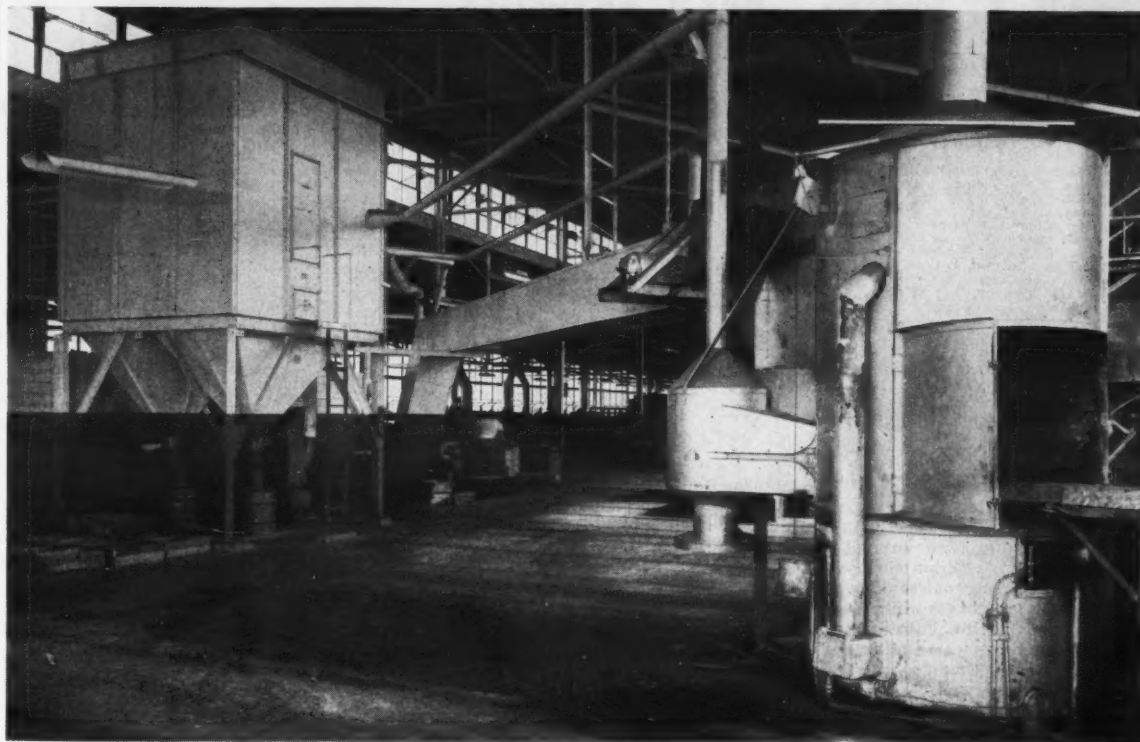
As part of a continuing program, MCA is embarking this year on a venture which we hope will help this situation. We are sponsoring an annual "Chemical Progress Week" (May 17-22). For the first time, the companies making up MCA will be able to fire the chemical industry story in a volley rather than in separate shots.

The enthusiastic cooperation and support of the member companies have lived up to expectations. Although this year's effort will be a modest one, we feel sure a definite impact will be made particularly in and around the industry's plant-communities. Hundreds of speeches will be given before and during Chemical Progress Week with industry representatives speaking from every platform they can find, from women's clubs to Chambers of Commerce. A number of companies have decided to make Chemical Progress Week the time when they will open their doors to the community and invite groups to see and hear about the chemical industry in their town. Other work is being done in connection with students, teachers, businessmen, the press and other opinion-molding groups.

I assume that everyone reading this publication has a direct interest in the chemical industry. I would like to ask you to do two things. During Chemical Progress Week talk to at least one person who doesn't know too much about our industry and tell him why you are associated with it. This isn't too difficult to do — the person you talk to may be your wife, your son, or the man you commute to work with.

Then, after the week is over drop me a note about your reaction to it. This first "Chemical Progress Week" is in the nature of a pilot-plant operation and we will be happy to get your opinion of it.

pioneering developments keep DUSTUBE® first in dust control



## removing the charge from storage battery dust

**Dustube® controls lead dust at its source**

Lead oxide dust and fume have ceased to be problems for the Willard Storage Battery Company. Battery manufacturing operations in four of its plants are ventilated by high-efficiency Dustube Collectors. Troublesome dust is completely trapped at its source to keep the working areas clean and dustfree. They have eliminated pollution of the air with the lead oxide dust and

fume created by plate cutting machines, dross hoods over refining kettles and scrap conveyors used in manufacturing storage batteries.

As in plants that set the pace in every industry, the Dustube Collectors were selected by Willard engineers for their many cost-savings features and their high collecting efficiency. "The control of lead dust at its source is

of prime importance in our plant," writes Mr. R. J. Halsall, Works Manager of the Memphis plant, "and in planning for its effective control, Willard engineers with years of experience in this field, specified our present equipment to handle the job."

You, too, can depend on a Dustube installation for dust control that is a more efficient, less costly, and better engineered to your specific requirements.



Catalog 372 explains the reasons why Dustube Collectors control dust more efficiently at lower cost. Send for your copy today.

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WHEELABRATOR & EQUIPMENT CORP.

**dustube**  
COLLECTORS

478 S. Byrkit St., Mishawaka, Indiana

When inquiring check CP 8720 on handy form, pgs. 2-3

MAY, 1954



# MIX IT better ... MIX IT faster

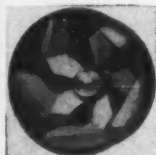
... the **TUMBLING ACTION** mixer for intimate blending of dry ingredients

A Munson Rotary Batch Mixer provides faster, more intimate blending of dry ingredients — yet will not stratify ingredients or alter characteristics of basic components. Its famous 7-way mixing action, plus low operating costs easily makes the Munson first choice for performance and economy.



**MUNSON**  
ROTARY BATCH MIXER

**EXCLUSIVE  
MULTIPLE-  
BLENDING  
ACTION I**



Lifters continuously cut out and lift ingredients as drum slowly revolves. Rotating cone tumbles stock to center. Conveyor flights on mixer shaft also agitate stock back to center — where mixing cycle repeats. Empties completely after every mix.

**UNEQUALLED FOR  
DRY MIXING OF:**

Chemicals, Fertilizers,  
Feeds, Cereals,  
Gelatin, Glue,  
Soap Compounds, etc.

Munson Rotary Batch Mixers can be fitted with internal spray for introduction of limited amount of liquid. Mixers range in capacities from 40 to 200 cu. ft. — for working floor, overhead or basement installation.

Skilled Munson engineers will be glad to help you solve your mixing problem. Write us today . . .

Other famous **MUNSON** products:  
Rotary Knife Cutters, Hammer Mills,  
Attrition Mills, Rotary Crushers . . .

**MUNSON MILL MACHINERY CO. Dept. P-554 Utica, New York**

When inquiring check CP 8721 on handy form, pgs. 2-3

## What's A "New Solution"?

It's an article in **CHEMICAL PROCESSING** describing a new way of solving a tough plant operating problem. In each issue you will find specific "case histories" showing how these processing problems were solved. Each article states the operating problem . . . explains the process used and gives details of how problem was solved . . . shows results secured.

Take a look at "New Solutions" articles in this issue — they might suggest a "solution" for some of your tough processing problems.

## Convention & Exhibit Schedule 1954

May 4-7. American Welding Society, National Spring Meeting, Hotel Statler, Buffalo, New York.

May 11. American Institute of Chemical Engineers, New Jersey section, 5th Annual Meeting, Hotel Essex House, Newark, New Jersey.

May 12-14. American Institute of Chemists, 31st Annual Meeting, Hotel Berkeley-Carteret, Asbury Park, New Jersey.

May 16-19. American Institute of Chemical Engineers, National Meeting, Kimball Hotel, Springfield, Mass.

May 17-20. Basic Materials Exposition and Conference, International Amphitheatre, Chicago, Illinois.

May 20. Chemical Market Research Association, Meeting, Hotel Statler, New York City.

May 25-28. American Society for Testing Materials, Committee E-14 on Mass Spectrometry, Hotel Jung, New Orleans, Louisiana.

May 27-28. American Drug Manufacturers Association, Production and Engineering Section, Spring Meeting, The Homestead, Hot Springs, Virginia.

June 7-10. The Society of the Plastics Industry, Inc., Sixth National Plastics Exposition, Cleveland Auditorium, Cleveland, Ohio.

June 9-11. American Society for Quality Control, 8th Annual Convention, Jefferson Hotel, St. Louis, Missouri.

June 13-18. American Society for Testing Materials, Annual Meeting, Sherman and Morrison Hotels, Chicago, Illinois.

June 20-25. American Institute of Chemical Engineers, Special Meeting on Nuclear Energy, Ann Arbor, Michigan.

June 21-23. Chemical Institute of Canada, 37th Annual Conference and Exposition, Toronto, Canada.

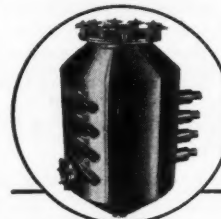
June 28-30. The American Society of Heating and Ventilating Engineers, 60th Semi-annual Meeting, New Ocean House, Swampscott, Massachusetts.

July 13-15. First Western Plant Maintenance Show, Pan-Pacific Auditorium, Los Angeles, Calif.

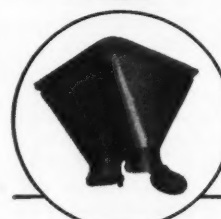
# Alloy Metals

Fabricated by Littleford  
for the Chemical  
Process Industries

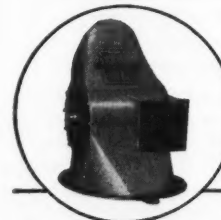
The Fabrication of Alloy Metals requires exacting, skillful workmen with the skill to shear, form and weld each metal with unerring precision. Littleford has fabricated such metals as Stainless Steel, Monel, Everdur, Nickel, Inconel, Herculoy and Aluminum into hundreds of products used by the Process Industries. Experience, plus modern equipment and a definite responsibility for the quality of the finished product are assurance of the finest workmanship. If you have a problem involving Alloy Metals, send your blueprints to Littleford for an estimate of cost, or write for Bulletin on Alloy Fabrication.



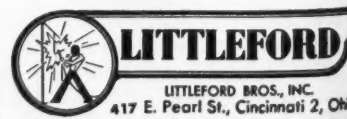
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**CHEMICAL PROCESSING**

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base  
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Analysis, E  
chemical  
Analyzers,  
Infrared  
Nitric O  
Anemomete  
Animal Fat  
Antioxidant  
Aromatics  
Autoclaves,

Bag Closing  
Bag Closing  
Bag Packing  
Bag Settler  
Bags, Paper  
Balances,  
Moisture  
Ball Mills,  
Barbs, Co  
Batteries,  
Bearings,  
Bellows  
Teflon  
Belts, Met  
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Blowers  
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Bronze-pla  
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Cabinets, S  
Calciners  
Calcium S  
Cameras,  
X-ray  
Carton Sti  
Castings, C

MAY,

Discussed in This Issue - - -

## PROCESSES, EQUIPMENT and MATERIALS



Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to pgs. 2-3 and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

<b>A</b>	Industrial	189, 197
	Nickel Alloy	213
	Catalysts	35
	Cathodic Protection Supplies	123
	Caustic Potash	36
	Caustic Soda	35, 36
	Cellulose Acetate	26
	Centrifugals	139, 166, 181
	Continuous	142
	Centrifuges, Batch	7
	Chelating Agents	28, 136
	Chemicals, Coal	32
	Commercial	206
	Chemistry Handbook	188
	Chillers, Liquid	87
	Chlorine, Liquid	36
	Clamps, Band	132
	I-beam	174
	Cleaners, Tube	170, 196, 200
	Cleaning, Ultrasonic	74
	Cleaning Materials, Industrial	163
	Cloth, Wire	215
	Clothing, Protective	62
	Clutch, Safety	150
	Coating Processes	124
	Coatings	118
	Corrosion-resistant	52, 114, 124
	Corrosion-resistant Metal	22
	Heat-resistant	22
	Neoprene	118
	Protective Opp. 27, 96, 120, 206	
	Resin-base	9
	Zinc	122
	Collectors, Circular	216
	Combustion Controls	16
	Comparators	76
	Compounds, Abrasive	208
	Compressors	209
	Recycle	161
	Turbo	210
	Computer Components	46
	Computers	90
	Color	90
	Condensers	47, 87
	Barometric	143
	Conduits, Electrical	63
	Connector Panels	84
	Connectors	84
	Containers, Steel	132
	Control Systems, Photoelectric	193
	Controllers	72, 74, 90
	Batch	76
	Liquid-level	71
	Pneumatic Thermometer	188
	Pressure	71
	Controls	182, 183
	Door	102
	Liquid-level	106
	Steam Pressure	11
	Conveyor Systems	99
	Conveyors, Air	110
	Air-Gravity	105
	Cable	111
	Pneumatic	102
	Rubber Belt	98
	Telescopic Boom	108
	Tubular	104
	Unloader	104
	Vibrating	110
	Coolers	39, 87, 201
	Rotary Air	214
	Rotary Water Tube	214
	Cooling Towers	87, 175
	Copper, C-R	118
	Coumarin	24, 25
	Counters, Electronic	73, 94
	Couplers, Air Hose	150
	Couplings	155
	Air Valve	170
	Flexible Teflon	158
	Crocks, Laminated	88
	Crystallizers	208
	Cutters, Metal	168
	Cylinders, Gas	102
	Hydraulic	169
<b>B</b>		
	Bag Closing	131
	Bag Closing Machines, Portable	132
	Bag Packers	126, 130, 131, 135
	Bag Settlers	126
	Bags, Paper	135
	Balances, Analytical	85, 86
	Moisture	84
	Ball Mills, Vibrating	39
	Baths, Controlled-temperature	94
	Batteries, Truck	190, 191
	Bearings, Ball	107
	Bellows	119
	Teflon	219
	Belts, Metal Conveyor	215
	Benzophenones, Substituted	18
	Biochemicals	202
	Blenders	146
	Laboratory	90
	Blending Units	155
	Blinds, Pipeline	166
	Blowers	121
	Exhaust	123
	Boiler Data	196
	Boilers, Automatic Packaged	156, 157, 167, 193
	Self-contained	175
	Books, Technical Data	86
	Bronze-plating Process	159
	Buckets	206
<b>C</b>		
	Cabinets, Storage	176
	Calciners	201
	Calcium Silicate	28
	Cameras, Photomicrograph	89
	X-ray	203
	Carton Stitching	128
	Castings, Centrifugal	152

# Cast for the role of resisting wear



## "S" Monel Sleeves



### Six advantages of Inco Castings

1. You get castings that generally outlast other materials under destructive service conditions. That's because they are made of Inco Nickel Alloys, which have been especially developed to withstand corrosion, abrasion, erosion and galling.
2. You get high quality castings because they are made to meet or exceed Government specifications for these high Nickel alloys.
3. You get castings in any practical design or size you need including centrifugal castings and standard pipe fittings. Inco has specialized in castings for over 47 years and is equipped to make your castings whether they weigh a few ounces or tons.
4. You get the benefit of Inco's help in solving your metal problems based on wide experience in field and laboratory testing of Nickel Alloys.
5. You get Inco Nickel Alloy castings made at Inco's own foundry; your assurance of sound, dependable castings.
6. Even castings you previously thought impractical to produce in Monel®, Nickel or Inconel® can often be cast by Inco's specialists.

How often have you wished you could get a wearing sleeve that would resist destructive conditions like abrasion and corrosion? Then take a look at these two sleeves.

The "S"® Monel sleeve pictured at top goes on the shaft of a salt water circulating pump.

Severe abrasion and corrosion from the sandy salt water in the gland seals used to wear out shaft sleeves in these pumps every 2½ years. Usually sooner.

Then the engineers decided to try Inco-Cast "S" Monel sleeves. *These sleeves have already withstood this abrasive and corrosive attack for nearly five years!*

Pictured in the second photo is the rotor-shaft-sleeve assembly for a midget Jordan machine. This machine processes highly abrasive raw asbestos. Ordinary sleeves were lasting only 15 months.

Then centrifugally-cast "S" Monel sleeves were tried. Judging from their appearance after more than a year's service, their owners estimate these sleeves will give "ten times as much service".

Unusual service like this is common when "S" Monel is used. Field records show it generally gives from three to ten times longer life than ordinary materials where service conditions involve destructive abrasion, corrosion, galling, or erosion.

Do you want to know more about this age-hardenable, corrosion-resisting casting alloy? Data on its composition, properties, and working instructions are summarized in a new bulletin, "Engineering Properties of 'S' Monel." Write for a copy today.

**THE INTERNATIONAL NICKEL COMPANY, INC.**  
67 Wall Street New York 5, N. Y.



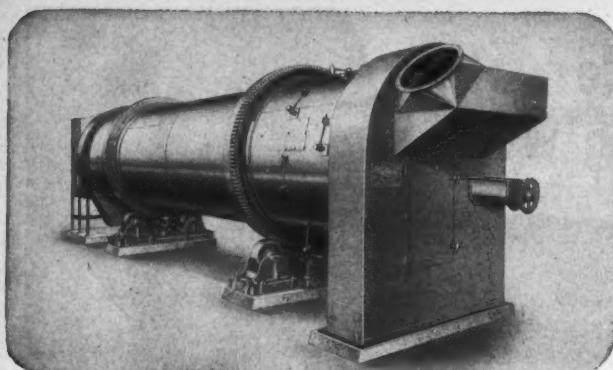
## Inco Castings

Sand, Centrifugal, Precision

When inquiring check CP 8723 on handy form, pgs. 2-3

MAY, 1954





## "DAVENPORT" ROTARY HOT AIR DRYERS

For materials or products that are critical to high temperatures, solve your drying problems with a "DAVENPORT" Rotary Warm Air Dryer. Shell is available in carbon steel, solid stainless steel or stainless clad.

Write for our complete catalog. Or, for quick reference, see your 1953 or '54 Chemical Engineering Catalog.

**DAVENPORT MACHINE AND**  
*Foundry Company*  
DAVENPORT IOWA



DAVENPORT

De-Watering  
Presses and  
Screens

ROTARY

Steam Tube, Hot  
Air and Direct Fire  
Dryers

Water Tube and  
Air Coolers

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## When Your Process Demands FILTERING MIXING STORING



LOOK FOR THESE  
FEATURES

PROVED, LOW-COST OPERATION  
EASY TO CLEAN  
DEPENDABLE, TROUBLE-FREE  
PERFORMANCE  
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LOW UPKEEP

Regardless of the size or type of your installation, whatever your process may be, there's an Alsop Filter, Mixer and Storage Tank to "fit your job", you can be sure of getting from Alsop the right unit properly applied — you can depend on Alsop proved performance features. Alsop Filters, Mixers and Tanks are available in a complete range of sizes and capacities and Alsop Equipment is custom fitted to your application by engineers who have thorough experience in Filtration and Agitation. Look for the proved features and the benefits that Alsop Filters, Mixers and Tanks can bring to your processing operations. Write for full information, recommendations and quotations.

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905 Alsop Square, Milldale, Connecticut

When inquiring check CP 8725 on handy form, pgs. 2-3

D

Defoamers, Silicone	12
Dehydrating Equipment	214
Dehydrating Units	218
Demineralizers	191
Detectors, Ammonia	60
Sulfur Dioxide	65
Detergents	28
Dewatering Presses	214
Dewatering Screens	214
Dewatering Valves	21
Diamines	20, 21
Diaphragms, Plastic	73
Diethylene Glycol	24
Diethylhexyl Adipate	24, 25
Disocetyl Phthalate	210
Dimethyl Hydantoin	34, 35
Dioctyl Phthalate	210
Diphenylamine, Indicator	32
Dipping Baskets	120
Grade	120
Sodium Phosphate, Anhydrous	Opp. 15
Dispersants	12
Distillation	141
Drill Jigs, Multiple	114
Drive Safety	150
Drives, Fractional HP	172
Packaged	182, 183
Roller Chain	162
Sheave	208
Drum Handling Equipment	140
Drums, Fibre	129
Steel	134
Dryers	46, 90, 201
Batch	201
Plastics	201
Rotary Direct Fire	214
Rotary Hot Air	214
Rotary Steam Tube	214
Drying Equipment	160
Dust Collection	195
Dust Collection Systems	61
Dust Collector Bags	47
Dust Collectors	47
9, Opp. 27, 46, 201, 211	
Suction Filter	141
Dust Control Equipment	180
Dyeing Assistants	20
Dyeing Machines	144

E

Ejectors, Steam-jet	52
Electric Heating	210
Electrical Insulating Resin	29
Electro Polarizers	96
Electrodes, Nylon	50
Elevator Belts	184
Elevators, Manlift	109
Emulsifiers	20, 21, 42
Emulsions	42
Acrylic	198
Enamels, Instant Drying	22
Enclosures, Explosion-proof	54
Engineering Materials	17
Ethanol	23
Ethylene Glycol	24
Ethylene Oxide	24
Evaporators	208, 220
Exhausters	121
Extinguishers, Wheeled	59
Extractors	138

F

Fabrication	187
Instrument Panel	92
Metal	142, 189, 202, 215
Plastic	44
Processing Equipment	164
Fabrics, Industrial	204
Fans, Corrosion-resistant	44, 141
Fasteners	43
Fats and Oils Bibliography	40
Fatty Acids	34, 37, 49
Coconut Oil	20, 21
Modified	30
Saturated	24
Fatty Acids & Derivatives	42
Fatty Amines	49
Fatty Alcohols	33
Feeder Weigher Systems	153
Feeders	139, 147
Reagent	120
Rotary Airlock	154
Vibratory	126
Fibers, Textile	27
Filters for Rubber	19
Filling Machines, Bag	132
Liquid	130
Powder	130
Filter Aids	203
Filter Cloth, Nylon	113
Filter Paper	113
Filter Presses	112, 204
Filters	7, 176, 188, 214

G

Celite	163
Disc	216
Horizontal	148
Pressure	185
Process	144
Rotary Drum Vacuum	148
Filtration Units	179
Fire Protection	57
Fire Protection Equipment	55
Firebrick, Insulating	177
Firefighting School	64
Fittings	opp. 62
Aluminum	116, 117
Corrosion-resistant 56, 3rd Cover	
Pipe	190
Plastic Tube	173
Stainless	125
Swivel	137
Welding	3, 59, 65
Flame Arrestors	186
Flame Pilots	165
Floor Patch & Resurfacer	222
Floor Paving	186
Flooring, Open Steel	60
Steel-reinforced	204
Flow Regulators	78
Flowmeters, Steam	68
Fluorescent Lighting	90
Fluorescent Pencils	Opp. 27
Foam, Fire-fighting	63
Foamed Plastisol Process	44
Formaldehyde	30
Formic Acid	Opp. 15
Fumaric Acid	24, 25

G

Gages, Density	72
Ionization	60
Liquid-level	109, 214
Tank	133
Galvanometers	96
Gas Masks	58
Gases	42
Gaskets	210
Spiral-wound	123
Teflon	86
Gelling Agents	30
Generators, Steam	160
Germanium	Opp. 56
Gloves, Industrial	56
Laboratory	93
Glycerine	31
Graph Readers	70
Grating, Metal	64
Steel	204

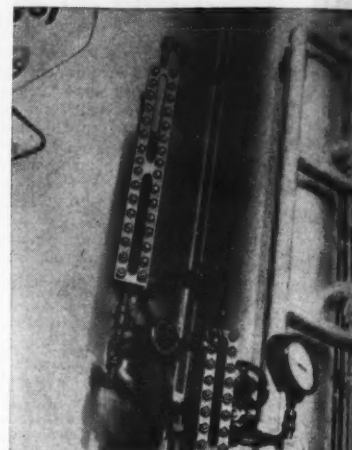
H

Hafnium Carbide	34
Hand Cleansers, Waterless	180
Hand Cream	57
Hats, Protective	65
Head & Eye Protection	59
Heat Exchanger Tubes	154, 188
Aluminum	116, 117
Heat Exchangers 16, 17, 87, 90, 168, 180, 195, 199, 205, 207, 208, 218	
Heat Sealing Machines	135
Heaters, Drum	162
Hot Water Storage	189
Infrared	87
Radiant	153
Water	86
Heating Cables	48
Heating Elements	176, 186
Heating Systems	145
Herbicides	43
Homogenizers	221
Hose, Flexible	124
Metal	89
Humidity Test Cabinet	88
Hydrogen Peroxides	34, 35, 37

I

Idlers, Belt Conveyor	104
Indicating Solutions, pH	95
Indicators, Dew Point	80
Electronic Level	72
Gas Analysis	80
Liquid Level	199
Sulfur Dioxide	Opp. 92
Instrument Panels	92
Graphic	69
Instruments, Control	80
Insulation, Cellular Glass	13
Pipe	152, 205
Insulation Products	202
Insulation Testers	78
Intercommunications Systems	88
Intermediates	Opp. 27, 42
Ion Exchange, Continuous	48
Ion Exchangers	64
Isomers, Butylene Oxide	31
Isopropanol	23
Isopropylaminoethanols	32

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## JERGUSON Series #5 Reflex Gages Give you up to 19 1/4" of Clear Visibility

THE sharp black-white contrast of the liquid level against the empty space above, in Jerguson Series #5 Reflex Gages, makes possible highly accurate liquid level readings even where lighting is poor.

To give you extra long service, the gages are corrosion resistant; and the glasses are specially treated with Jerguson Anti-Fouling Compound to give clearest visibility over a long period.

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Observation of Liquids and Levels  
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CHEMICAL PROCESSING

here's automation at work

with a CAMBRIDGE

## WOVEN WIRE CONVEYOR BELT!

Fine and small particle sized minerals move through this dryer continuously, automatically, without manual handling, on a Cambridge Woven Wire Conveyor Belt. Pellets, tablets or other bulk loads can be similarly handled.

Regardless of process temperatures, corrosive or abrasive conditions, a Cambridge Woven Wire Conveyor Belt can help you cut manufacturing costs by contributing to automation—continuous, automatic production.

They're all metal, can be woven from any metal or alloy. Thus, they are impervious to damage from heat, cold, abrasion or corrosion. Open mesh construction provides free circulation of process atmospheres, free drainage of process solutions. Available in varied specifications for varied loads. Special side and surface attachments to hold bulk materials during flat or inclined movement are available.

### Get the full story—FREE!

Learn how Cambridge belts help provide continuous, automatic production—automation! Write today for your free copy of this technical manual of belt applications.



Or, for immediate advice, call in your Cambridge Field Engineer. See "Belting-Mechanical" in your classified telephone book for the Cambridge man nearest you. Or write direct.

## The Cambridge Wire Cloth Co.

Dept. F • Cambridge 5, Md.



WIRE CLOTH METAL CONVEYOR BELTS SPECIAL METAL FABRICATIONS

OFFICES IN LEADING INDUSTRIAL AREAS

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MAY, 1954

J	
Jacketing, Aluminum	161
Joints, Expansion	45
Revolving	92
Rotary	187
Rotary Steam	51
Self-supporting	174
Teflon Expansion	158

K	
Kettles	170
Agitated	203
Cooking	155
Resin	145
Kilns	201

L	
Laboratories, Model	93
Laboratory Chemicals	206
Laboratory Equipment	56
Laboratory Furniture	209
Laboratory Planning	209
Ladders, Safety Step	100
Latex Foam Gel Sensitizers	20, 21
Lead Products, Corrosion-resistant	220
Lift Truck Accessories	106
Lift Truck Attachments	201
Lifts, Mobile	105
Lighting Fixtures	171
Linings, Acid-resistant	8
Corrosion-resistant Rubber	151
Tygon	115
Lithographing Facilities	132
Lubricants, Multi-purpose	169
Lubricators, Forced-feed	203

M	
Magnets, Pulley	15
Maleic Anhydride	35
Mantles, Laboratory	200
Marking Machines	130
Materials Handling Equipment	100, 110
Metal Fabrication, Alloy	212
Metal Treatment	198
Metals, Pressed	176
Meteorological Equipment	66
Meters, Conveyor Flow	77
Fabric Permeability	80
Liquid	80, 159
pH	85
Steam	68
Tilting U-tube	207
Methanol	23
Methionine	Opp. 27
Methyl Esters	34
Methyl Toluene Sulfonate	24
Microscope Readers, Brinnell	78
Mills	160
Colloid	147
Conical	202
Dispersion	142, 147, 199
Grinding	135
Pulverizing	192
Minimum-thickness Holes	114
Mixers	40, 41, 138, 170, 214
Liquid	8
Rotary Batch	212
Thermostatic Water	81
Mixing Units	155
Motor Insulation	Opp. 51
Motors, Electric	Opp. 163, 178, 182, 183, 186, 189
Fractional HP	152
Instrument	188
Wound Rotor	199

N	
Natural Gas Petrochemicals	26
Nickel Alloys	40
Nozzles, Fog	63
Spray	164

O	
Oils, Bodying	42
Industrial	37

Ointments, Protective	Opp. 27
Oleic Acids, Sulfonated	33
Organic Chemicals	27
Organic Syntheses	83
Oscillogram Processors	97
Ovens	90
Laboratory	87, 88, 195
Oxalic Acid	Opp. 15
Oxygen Analysis Systems	13

P	
Packaging Machines, O-ring	132
Packaging Problems	202
Packaging Techniques	199
Packings, Hydraulic	206
Pump	162
Teflon	86, 219, 222
Painting Practice	209
Paints, Masonry	120
Paper Pulp Additive	20
Paradichlorobenzene	36
Pertreated Metals	200
Phones, Explosion-proof	61
Phosphoric Acid	Opp. 15
Phosphorus Compounds, Surface-active	Opp. 15
Physics Handbook	188
Pigments, Latex Paint	24
Reinforcing	28
Piling Machines	108
Pipe	188
Aluminum	116, 117
Plastic	45, 53
Pipe Threaders	166
Pipes & Fittings, Chemical-resistant	151
Plant Engineering	168
Plant Modernization	171
Plastering Machines	153
Plastic, Corrosion-resistant	151
Reinforced	117
Plastic Sheets, Cast	206
Plasticizers	24, 25, 26
Plasticizers for PVC	26
Plasticizers for Vinyls	28, 35
Platecoils	166
Platforms, Work	100
Plating Solutions, Analysis of	96
Plating Unit	154
Polybutenes	19
Polyethylene as a Lubricant	188
Polyvinyl Acetate Emulsion	22
Polyvinyl Alcohol	34, 35
Polyvinyl Chloride Plates	124
Porous Media	150
Potash, Carbonate of	36
Power Tools, Air-operated	177
Presses, Filter	112
Process Equipment, Aluminum	116, 117
Power Supplies	96
Preservatives	11
Process Engineers	187
Processing Equipment	144
Propellers	12, 184
Protective Clothing	57
Pulverizers	139
Pumps	148, 174, 197, 204, 222
Acid-handling	215
Bronze	154
Centrifugal	193, 194
Chemical	83
Controlled-volume	48, 92
Corrosion-resistant	124
Diaphragm	216
Diffusion	60
Feeder Metering	2nd Cover
Heat	87
Liquid Transfer	210
Micro-bellows	120
Portable	160
Process	50
Proportioning	208
Rotary Vacuum	164
Sanitary	39, 150
Self-priming	122
Vacuum	13, 191, 200
Vertical	130
Vertical Sump	168
Pyrometers, Portable	81
Pyrolydine	34, 35

R	
Radiochemicals	202
Reactors	47, 146
Readers, Graph	70
Receivers, Liquid	87
Recorders	74
Automatic Scanner & Digital	76
Flow	77
Multi-point	81
Oscillographic	197
Temperature	78
Rectifiers, Mechanical	62
Phenolic Cartridge	176
Regulators, Temperature	79, 81
Voltage	217
Relays, Electrical	165
Overload	165
Time Delay	75

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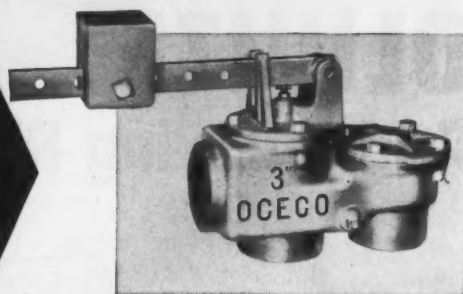
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● These valves combine both vacuum relief and pressure relief in a single body and avoid the necessity of using two separate valves when both vacuum relief and pressure relief are desired. 3 inch, 4 inch and 6 inch sizes. Steel bodies. Bronze, stainless steel or aluminum

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Remote Control Tractor	188
Resins	4th Cover
Epoxy	29
Oil-resistant	37
Polyamide	49
Polyester	21
Self-extinguishing	21
Styrene	23
Thermosetting	27
Respirators	14
Roller Chains	14
Ropes, Plastic	64
Rotameters	80
Rubber, Corrosion-resistant	151
Filler for	19
Rubber-nylon Bonding	46
Rubber Sheet	167

S

Sacks, Multiwall	127
Safety equipment	64
Safety Kite Book for Employees	197
Scale removal	197
Scaler, Radiation	202
Scales, bagging	132, 134
filling	128
Laboratory	91
Mobile Bulk	100
Pneumatic Platform	128
Portable	80
Screens, Vibrator	140
Scrubbers, Fume	143
Seals, Mechanical	101
Paint Can	134
Piston	172
Seat Rings	116
Separators, Centrifugal	94, 140
Continuous	58
Oil	87
Sequestrants	205
Sewing Machines	133
Sheaves	149
Shims	210
Shovels, Tractor	101, 103, 108
Showers, Column	58
Multi-stall	58
Shredders, Swing Hammer	140
Sifters, Turbo	152
Silicates, Ethyl	31
Silicone Rubbers	36
Silos, Concrete	107
Silver	116
Sinks, Polyethylene	95
Sizing Starches	25
Sodium	34, 35
Dispersed	Opp. 27
Sodium Formate	Opp. 15
Sodium Tripolyphosphate	Opp. 15
Soil Stabilization	41
Solvents	208
Penetrating	185
Spacer Rings, Pipeline	166
Spectrophotometers	88
Speed Reducers	156, 178
Spray Guns	180
Sprinklers, Automatic	60
Sprockets	14
Stabilizers, Emulsion	205
Stair Treads, Steel	124
Staplers, Carton	129
Statistical Quality Control	50
Statistics, Small Particle	82
Steam Reduction	11
Steam Traps	5, 79, 144, 171
Stearic Acids	20, 21
Steel, Stainless	119
Stitching, Carton	128
Storage Systems	94, 107
Storage Tanks, Aluminum	116, 117
Strainers, Integral	193
Styrene Copolymer	23
Surface-active Agents	34, 38, 207
Sulfur Compounds	10
Switches, Mercury	195

T

Tachometers	78
Tail Oils	20, 191
Tanks, Corrosion-resistant	155
Gas	111
Stainless Storage	100
Storage and Mixing	214
Tantalum	116
Tape, Rubber	125
Strapping	131
Technical Reports	53
Teflon Finishes	156
Testers, Electrical Resistance	71
Moisture	209
Tetrachloro Phthalic Anhydride	36
Tetrahydrofuran	34, 35
Thermal Controls	70
Thermocouples	75, 92
Thermometers, Dial	205
Industrial	68
Mercury	74
Vapor Pressure	73
Thickeners	216

Thread-sealing Compounds	164
Titanium Powder	37
Towers, Hydraulic Scrubbing	184
Tractor Shovels	101, 103, 108, Opp. 111, 200
Transmitters, Flow Signal	76
Heat Flow	79
Pressure	69, 78
Traps, Impulse Steam	193
Trichlorethylene	36
Trucks, Book Rack	107
Drum	140
Drum and Barrel	106
Fork	103
Fork Lift	98, 102
Hydraulic Fork	110
Industrial	190, 191
Lift	100, 102, 110
Shovel	104
Tube Cleaners	200
Tube, Condenser	91, 93
Heat Exchanger	91
Instrument	75
Protection	185
Stainless	122
Welded	97
Tubing, Jumpovers	179
Turbines, Steam	51, 151

U

Ultraviolet Light Absorbers	18
Unions, Rotary	220
Unloaders, Hydraulic	110
Utensils, Stainless	184

V

Vacuum Cleaners	3rd cover
Vacuum Pumps	194
Valves	88, 106, 177
Butterfly	82, 158, 164
Chemical Service	174
Compressor	218
Control	67, 72, 169, 181, 208
Controlled-closing	187
Diaphragm Control	167
Diaphragm Motor	207
Gate	195
Mudline	182
Pilot	79
Plastic	118
Polyethylene	121
Porcelain	15
Pressure & Vacuum Relief	216
Reducing	173
Relief	198
Remote-controlled	204
Repair of	178
Resin Dewatering	14
Solenoid	79, 119, 184
Steel	200
Vaporizers	164
V-belt Drives	177
V-belts	161, 175
Vent Units	186
Ventilators	172
Venturi Tube	191
Vessels, Pressure	16, 17
Vibration Analyzers	60
Vibrators	219
Air	102
Electric	106
Self-starting	126
Vinyl Processing	188

W

Washers	210
Dust Collector	157
Waste Water Treatment	38
Water Distributing Pans	146
Water Hardness Tests	183
Welding Developments	198
Welding Helmets	58
Welding Wire	149
Wires, Thermocouple	188

X

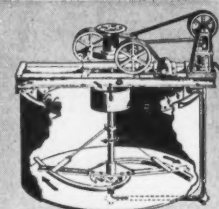
Xanthine Compounds	34
--------------------	----

Z

Zinc Thioglycate	19
------------------	----

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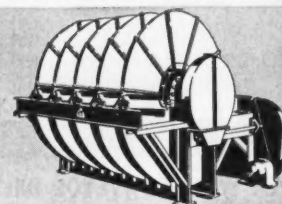


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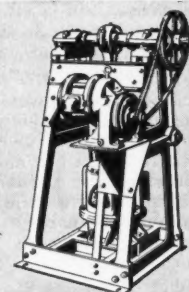


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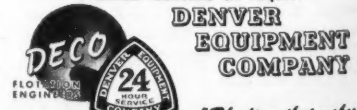
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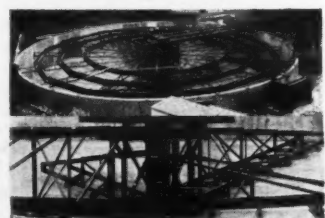
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A

B

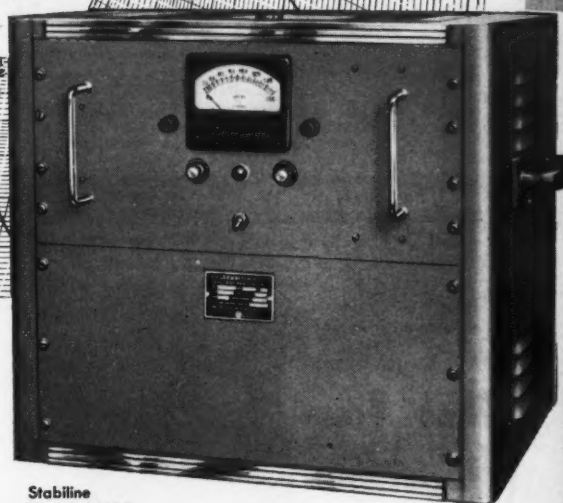
Abbe Engineering Company .. 152  
 Agency-Spooner & Kriegel  
 Acme Industries, Inc. .... 87  
 Agency-The Jaqua Company  
 Aerofin Corporation ..... 180  
 Agency-Richards & Webb, Inc.  
 Airetool Manufacturing Company ..... 170  
 Agency-Harry M. Miller, Inc.  
 Air Reduction Magnolia Co., A Division of Air Reduction Company, Incorporated ..... 42  
 Agency-G. M. Basford Company  
 Allis-Chalmers Mfg. Co. .... 50, 133, 149, 189  
 Agency-Compton Advertising Inc.  
 Allis-Chalmers, Tractor Division ..... 101  
 Agency-Bert S. Gittins  
 Alsop Engineering Corporation Aluminum Company of America ..... 116, 117  
 Agency-Ketchum, MacLeod & Grove, Inc.  
 American Agile Corporation .. 44  
 Agency-Herb W. Buerger  
 American Air Filter Company, Inc. .... 9  
 Agency-Doo-Anderson Advertising  
 American Chemical Paint Company ..... 96  
 Agency-May Advertising Company  
 American Cyanamid Company, Petrochemicals Department ..... 33  
 Agency-Hazard Advertising Company  
 American District Steam Company, Inc. .... 45  
 Agency-Warman, Robins & Gorham, Inc.  
 American Hard Rubber Company ..... 118, 151  
 Agency-W. L. Towne Advertising  
 American Machine & Metals, Inc., Niagara Filters Division ..... 185  
 Agency-Marsteller, Gebhardt and Reed, Inc.  
 American-Marietta Co., Valdura Paint Division ..... 114  
 Agency-Turner Advertising  
 American Wheelabrator & Equipment Corp. .... 211  
 Agency-The Jaqua Company  
 Ampco Metal, Inc. .... 95  
 Agency-Hoffman & York, Inc.  
 Annin Company, The ..... 67  
 Agency-The McCarty Company  
 Antara Chemicals, Division of General Dyestuff Corporation ..... 28  
 Agency-The House of J. Hayden Twiss  
 Armour and Company, Armour Chemical Division ..... 20, 21  
 Agency-Foote, Cone & Belding  
 Armstrong Machine Works ..... 171  
 Agency-Russell T. Gray, Inc.  
 Aurora Pump Company, Division of the New York Air Brake Company ..... 168  
 Agency-Fred A. Hinrichsen Advertising  
 Autoclave Engineers, Inc. .... 92  
 Agency-Mitchell Advertising  
 "Automatic" Sprinkler Corporation of America ..... 60  
 Agency-The Robert A. Joyce Company

Babcock & Wilcox Co., The, Refractories Division ..... 177  
 Agency-Michel-Cather, Inc.  
 Babcock & Wilcox Company, The, Tubular Products Division ..... 122  
 Agency-O. S. Tyson and Company, Inc.  
 Bacharach Industrial Instrument Company ..... 78  
 Agency-W. S. Hill Company  
 Baker-Lull Corporation, The .. 108  
 Agency-G. M. Basford Company  
 Baker Perkins Inc., Chemical Machinery Division ..... 181  
 Agency-Price, Tanner & Wilcox, Inc.  
 Baldwin-Hill Company ..... 152  
 Agency-Eldridge, Inc.  
 Ballymore Company ..... 100  
 Agency-The Eldridge Company  
 Barber-Colman Company ..... 74  
 Agency-Howard H. Monk & Associates, Inc.  
 Barco Mfg. Co. .... 92  
 Agency-Armstrong Advertising  
 Bartlett & Snow Co., The C. O. .... 201  
 Agency-Henry T. Bourne Advertising Agency, Inc.  
 Beach-Russ Company ..... 164  
 Agency-Spooner & Kriegel  
 Bemis Bro. Bag Company ..... 135  
 Agency-Gardner Advertising Co.  
 Benjamin Electric Mfg. Co. .... 90  
 Agency-Van Aken, Ragland & Stevens  
 Bersworth Chemical Co. .... 136  
 Agency-Meisner & Calver, Inc.  
 Beryllium Corporation, The .... 118  
 Agency-Gray & Rogers  
 Biddle Co., James G. .... 78  
 Agency-The Roland G. E. Ullman Org.  
 B-I-F Industries, Inc., Builders Providence Division ..... 77  
 Agency-Hammond-Goff Co.  
 B-I-F Industries, Inc., Omega Machine Company Division .. 147  
 Agency-Hammond-Goff Co.  
 B-I-F Industries, Inc., % Proportioners, Inc. %, Division 2nd Cover  
 Agency-Hammond-Goff Co.  
 Big Joe Manufacturing Company ..... 110  
 Agency-Glenn, Jordan, Stotzel, Inc.  
 Bird Machine Company ..... 7  
 Agency-Walter B. Snow & Staff, Inc.  
 Black Products Company ..... 126  
 Agency-Carl A. Anderson  
 Black, Sivals & Bryson, Inc., Climax Controls Division .... 71  
 Agency-R. J. Potts, Calkins & Holden, Inc.  
 Blaw-Knox Company, Automatic Sprinkler Department ..... 57  
 Agency-Ketchum, MacLeod & Grove, Inc.  
 Blaw-Knox Company, Blaw-Knox Equipment Division .. 206  
 Agency-Russell T. Gray, Inc.  
 Blaw-Knox Company, Blaw-Knox Equipment Division, Grating Department ..... 204  
 Agency-Ketchum, MacLeod & Grove, Inc.  
 Bowser, Inc. .... 80  
 Agency-Willis S. Martin Company  
 Bradley Washfountain Co. .... 58  
 Agency-Kirkgasser-Drew  
 Bridgeport Brass Company ..... 91  
 Agency-Hazard Advertising Company



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Bristol Company, The	73	Cooper Alloy Foundry Co., The	125
Agency-James Thomas Chirurg Company		Agency-Mabool Advertising, Inc.	
Brown Boveri Corporation	62	Coppus Engineering Corporation	172
Agency-Corbin Advertising		Agency-James Thomas Chirurg Company	
Buell Engineering Company	61	C-O-Two Fire Equipment Company	55
Agency-Hicks & Greist, Inc.		Agency-G. M. Batford Company	
Buffalo Forge Company	184	Crane Co.	195
Agency-Melvin F. Hall Adv. Agency Inc.		Agency-The Buchen Company	
Bufflovak Equipment Division of Blaw-Knox Company	46	Crane Packing Company	219
Agency-Ketchum, MacLeod & Grove, Inc.		Agency-Symonds, MacKenzie & Company, Inc.	
Builders-Providence, Inc., Division of B-I-F Industries, Inc.	77	Crouse-Hinds Company	63
Agency-Hammond-Golf Co.		Agency-Barlow Adv. Agency, Inc.	
B/W Controller Corporation	106	Crucible Steel Company of America	119
Agency-Rolfe C. Spinning, Inc.		Agency-G. M. Batford Company	

### C

Cambridge Instrument Co., Inc.	80
Agency-E. M. Freystadt Associates, Inc.	
Cambridge Wire Cloth Co., The	215
Agency-Emery Advertising Corporation	
Carbide and Carbon Chemicals Company, A Division of Union Carbide and Carbon Corporation	23
Agency-J. M. Matthes, Inc.	
Carboline Company	206
Agency-Batz-Hodgson-Neuwoebner Advertising	
Carborundum Company, The, Refractories Division	150
Agency-G. M. Batford Company	
Cash Company, A. W.	173
Cecilco Company, The	124
Agency-Penn and Hamaker, Incorporated	
Chemical & Power Products, Inc.	86
Agency-Spooner & Kriegel	
Chicago Bridge & Iron Company	100
Agency-Russell T. Gray, Inc.	
Chicago Pneumatic Tool Co.	209
Agency-G. M. Batford Company	
Chicago-Wilcox Mfg. Co.	210
Agency-Fred H. Ebersold, Inc.	
Clark Equipment Company, Construction Machinery Division	103
Agency-Marsteller, Gebhardt and Reed, Inc.	
Clark Manufacturing Company	144
Agency-Belden & Hickox	
Clarkson Company, The	120
Agency-Walther-Boland Associates	
Cleaver-Brooks Company, Boiler Division	175
Agency-Klau-Van Pietersom-Dunlap, Inc.	
Cleveland Vibrator Company, The	219
Agency-Wellman, Buschman & Hines, Inc.	
Cleveland Worm and Gear Co., The	178
Agency-The Griswold-Ebbleman Co.	
Coddington Mfg. Co., E. D.	135
Agency-Barnes Adv. Agency, Inc.	
Coe Manufacturing Company, The	86
Agency-T. H. Ball and Son	
Conax Corporation	92
Agency-Horace A. Laney	
Combustion Engineering, Inc., Raymond Division	192
Agency-Wamsley and Heer, Inc.	
Continental Can Company, Fibre Drum Division	129
Agency-Batten, Barton, Durstine & Osborn, Incorporated	

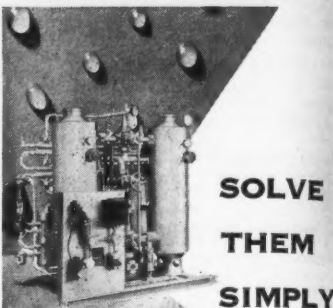
### D

Darling Valve & Manufacturing Co.	162
Agency-The Griswold-Ebbleman Co.	
Davenport Machine and Foundry Company	214
Agency-Bawden Bros., Inc.	
Day Company Incorporated, The J. H.	146
Agency-Strauchen & McKim	
Denver Equipment Company	216
Agency-Bill Bonisb Advertising	
Diamond Chain Company, Inc.	162
Agency-Kirkgaster-Drew	
Dicalite Division, Great Lakes Carbon Corporation	203
Agency-Darwin H. Clark Co.	
Dow Chemical Company, The	11
Agency-MacMannus, John & Adams, Inc.	
Dow Corning Corporation	12
Agency-Wagnitz Advertising Inc.	
Downingtown Iron Works, Inc., Division of Pressed Steel Tank Co.	218
Agency-The Buchen Company	
Dravo Corporation	60
Agency-Ketchum, MacLeod and Grove, Inc.	
Dresser Industries, Inc. (see Roots-Connorsville Blower Corporation)	166
Agency-Fuller & Smith & Rags, Inc.	
Du Pont de Nemours & Co. (Inc.), E. I.	33, 34
Agency-Batten, Barton, Durstine & Osborn, Inc.	
Du Pont de Nemours & Co. (Inc.), E. I., Polychemicals Department	29
Agency-Batten, Barton, Durstine & Osborn, Inc.	
Duriron Company, Inc., The	174
Agency-Kircher, Helton & Collett, Inc.	
Dustex Corp.	180
Agency-Watson Advertising	

### E

Eco Engineering Company	83
Agency-The Michener Company	
Edward Valves, Inc., Subsidiary of Rockwell Manufacturing Co.	200
Agency-Marsteller, Gebhardt & Reed, Inc.	
Eimco Corporation, The	179
Agency-Maisie Company	
Eitel-McCullough, Inc.	60
Agency-Conner-Jackson-Walker-McClure	
El Dorado Oil Works	34
Agency-Sidney Garfield & Associates	

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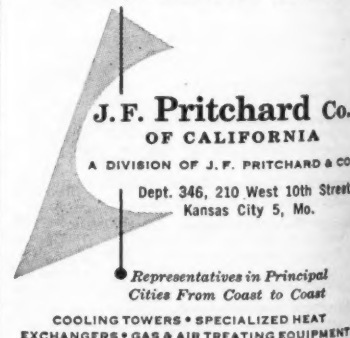
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CHEMICAL PROCESSING





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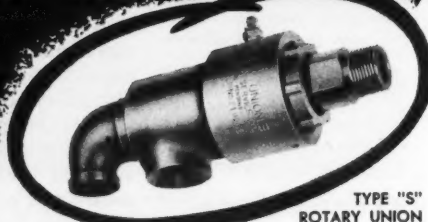
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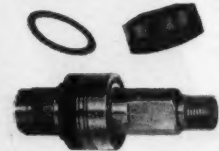
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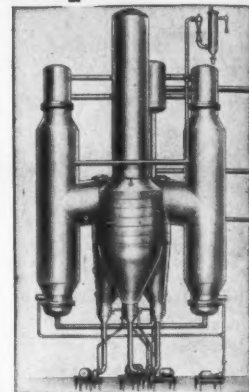
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When inquiring check CP 8739 on handy form, pgs. 2-3

Jerguson Gage & Valve Company Agency-Roy Elliott Company	214	Midland Industrial Finishes Co. Agency-Western Advertising Agency, Inc.	22
Johns-Manville Agency-J. Walter Thompson Company	165	Milton Roy Company Agency-Harris D. McKinney, Inc.	48
Johnson Corp., The Agency-Kreicker & Melan, Inc.	174	Mojonnier Bros., Co. Agency-Roy D. Zeff & Associates	220
Johnston & Jennings Co., The Division of Pettibone Mulliken Corp. Agency-Henry T. Bourne Advertising Agency, Inc.	216	Monsanto Chemical Company Agency-Gardner Advertising Company	24, 25
<b>K</b>		Moore & Company, Samuel, Dekoron Tubing Division Agency-Palm & Patterson, Inc.	75
Kellogg Company, The M. W., Chemical Manufacturing Division Agency-Gordon Baird Associates, Inc.	43	Morse Manufacturing Co., Inc. Agency-Chapman-Nowak & Associates, Inc.	140
Kellogg Company, The M. W., Fabricated Products Division Agency-Gordon Baird Associates, Inc.	47	Munson Mill Machinery Co. Agency-Moser & Cotins, Inc.	212
Kinney Mfg. Division, The New York Air Brake Company Agency-Hammond-Goff Co.	191	<b>N</b>	
Kuhns Brothers Company, The Agency-The Parker Advertising Company	190	Nagle Pumps, Inc. Agency-Tri-State Advertising Co., Inc.	222
<b>L</b>		National Business Publications, Inc. Agency-G. M. Baird Company	63
Ladish Co. Agency-Cramer-Krasselt Company	62	National Engineering Company, Simpson Mix-Muller Division Agency-Russell T. Gray, Inc.	40, 41
Lapp Insulator Co., Inc., Process equipment Division Agency-Ed Wolff & Associates	15	National Filter Media Corp., The Agency-Sanger-Fannell, Incorporated	113
Lee Metal Products Co., Inc. Agency-Walker & Downing	155	National Petro-Chemicals Corporation Agency-Sterling Advertising Agency, Inc.	26
Lefax Agency-H. Lesseraux	66	Neville Chemical Co., 4th Cover Agency-Ibe Advertising Agency of William Cohen	4
Leslie Co. Agency-Mercereau, Handy & van Denburgh	167	New England Tank & Tower Co. Agency-Hammond-Goff Co.	140
Librascope Incorporated Agency-Western Advertising Agency, Inc.	90	Newport News Shipbuilding and Dry Dock Company Agency-Marschall & Pratt Co., Inc.	142
Lift Trucks Incorporated Agency-Ibe Bobnett Company	102	Niagara Alkali Company Agency-Hazard Advertising Company	36
Link-Belt Company Agency-Klau-Van Pietersom-Dunlap, Inc.	14, 104	Niagara Filters Division, American Machine and Metals, Inc. Agency-Marsteller, Gebhardt and Reed, Inc.	185
Liquidometer Corp., The Agency-Lucerna Company, Inc.	133	Nicholson & Co., W. H. Agency-Wilbur A. Myers	5
Littleford Bros., Inc. Agency-Jaap-Orr Company	212	<b>O</b>	
<b>M</b>		Oberdorfer Foundries, Inc., Industrial Pump Div. Agency-Richards & Webb, Inc.	154
Manton-Gaulin Manufacturing Company, Inc. Agency-Sutherland-Abbott	221	Ohmart Corp., The Agency-Guenther, Brown & Berne, Inc.	72
Marathon Corporation, Chemical Division Agency-J. A. Cormack	12	Oliver United Filters Inc. Agency-Sanger Fannell, Incorporated	215
Marietta Concrete Corporation, The Agency-Harry M. Miller, Inc.	107	Omega Machine Company, Division of B-I-F Industries, Inc. Agency-Hammond-Goff Co.	147
Marman Products Co., Inc. Agency-West-Marquis, Inc.	132	Oronite Chemical Company Agency-L. C. Cole Company	19
Martin Engineering Company Agency-Kenneth B. Butler & Associates	126	Orr & Sembower, Inc. Agency-Beaumont, Heller & Sperling, Inc.	156, 157
Mason-Neilan Regulator Co. Agency-Sutherland-Abbott	169	Oster Manufacturing Co., The Agency-Meldrum and Fewsmith, Inc.	166
Merco Centrifugal Co. Agency-Wank & O'Rourke	58	<b>P</b>	
Metalsmiths, Division of Orange Roller Bearing Co., Inc. Agency-Thoma & Gill	184	Palmer Thermometers, Inc. Agency-The Bobnett Company	74
Michigan Wheel Co. Agency-Sterens, Inc.	184	Paltier Corp., The Agency-Vernon S. Weiler	94

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CHEMICAL PROCESSING

Patterson Foundry and Machine Company, The .....	8	Rietz Manufacturing Co. ....	90
Agency-Walker and Downing		Agency-Wank & O'Rourke	
Patterson-Kelley Co., Inc., The .....	199	Robinson Air-Activated Conveyor Systems, A Division of Morse Boulder Destructor Co. ....	110
Agency-O. S. Tyson and Company, Inc.		Agency-Sanger-Funnell, Incorporated	
Penberthy Injector Company, Division of the Buffalo Eclipse Corporation .....	109	Rockwell Company, W. S. ....	82
Agency-Comstock & Company		Agency-Spooner & Kriegel	
Perfecting Service Company ..	220	Rockwell Manufacturing Company .....	159
Agency-E. J. Presser and Co.		Agency-Marsteller, Gebhardt and Reed, Inc.	
Permutit Company, The .....	80	Roots-Connersville Blower, A Division of Dresser Industries, Inc. ....	166
Agency-Cunningham & Walsh Inc.		Agency-Fuller & Smith & Ross Inc.	
Plaudler Co., The .....	187	Ross & Son Company, Charles 160	
Agency-Charles L. Rumrill and Co., Inc.		Agency-Asher, Godfrey & Franklin, Inc.	
Pittsburgh Coke & Chemical Co., Coal Chemicals Division .....	32		
Agency-Walker & Downing			
Pittsburgh Corning Corporation .....	13		
Agency-Ketchum, MacLeod & Grove, Inc.			
Platecoil Division of Tranter Mfg. Inc. ....	166		
Agency-The Jaqua Company			
Pneumatic Scale Corp., Ltd. ..	130		
Agency-H. B. Humphrey, Alley & Richards, Inc.			
Potts Co., Horace T. ....	56		
Agency-The Roland G. E. Ullman Organization, Inc.			
Powers Regulator Co., The ..	81		
Agency-Symonds, MacKenzie & Company, Inc.			
Pritchard Co. of California, J. F., A Division of J. F. Pritchard & Co. ....	218		
Agency-Carter Advertising Agency, Inc.			
Process Filters Inc., Subsidiary of Bowser, Inc. ....	144		
Agency-Watson Advertising Agency, Inc.			
Proctor & Schwartz, Inc. ....	160		
Agency-Robert S. Kampmann, Jr.			
%Proportioners, Inc., Division of B-I-F Industries, Inc. ....	2nd Cover		
Agency-Hammond-Goff Co.			
Putman Publishing Company ..	118, 172, 198, 212		

R

Raymond Bag Company, The ..	127	Smith Corporation, A. O. 16, 17	
Agency-Doe-Anderson Advertising		Agency-Henri-Hurst & McDonald, Inc.	
Raymond Division, Combustion Engineering, Inc. ....	192	Sparkler Manufacturing Co. ....	176
Agency-Wamsley and Heer, Inc.		Agency-Kreicker & Meloan, Inc.	
Read Standard Corporation, Bakery-Chemical Division ....	138	Spencer Turbine Company, The .....	210
Agency-The W. H. Long Co.		Agency-W. L. Towne Advertising	
Reeves Pulley Company .....	172	Sperry & Co., D. R. ....	204
Agency-Caldwell, Larkin & Company, Inc.		Agency-Simmonds & Simmonds, Inc.	
Republic Steel Corporation, Steel and Tubes Division ..	154, 188	Spo Incorporated .....	102
Agency-Meldrum & Fewsmith, Inc.		Agency-Penn-Hamaker Incorporated	
Research Appliance Company ..	120	Spray Engineering Co. ....	164
Agency-Marsteller, Gebhardt and Reed, Inc.		Agency-Larcom Randall	
Resistoflex Corporation .....	124	Steel and Tubes Division, Republic Steel Corporation 154, 188	
Agency-Richard & Company, Inc.		Agency-Meldrum & Fewsmith, Inc.	
Revere Copper and Brass Incorporated .....	93	Stephens-Adamson Mfg. Co. ..	99
Agency-St. Georges & Keyes, Inc.		Agency-Glenn, Jordan, Stotzel Inc.	
Rheem Manufacturing Company .....	134	Stoker Company, H. L. ....	130
Agency-Campbell-Ewald Company		Agency-Dozier Eastman and Company	
Richardson Scale Co. ....	133	Sun Oil Company, Industrial Products Department .....	53
Agency-O. S. Tyson and Company, Inc.		Agency-Gray & Rogers	
		Superior Electric Co., The ..	217
		Agency-Sutherland-Abbott	

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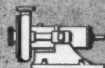
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222

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Swift & Company, Industrial  
Oils Dept. 37  
Agency-Russell T. Gray, Inc.

T

Taber Pump Company 130  
Agency-Tyler Kay Company,  
Inc.

Taylor Forge & Pipe Works 59  
Agency-Kreicker & Meloan,  
Inc.

Taylor and Co., W. A. 76  
Agency-Emercy Advertising  
Corporation

Taylor Instrument Companies 78  
Agency-Batten, Barton, Dur-  
stine & Osborn, Inc.

Telecomputing Corporation 76  
Agency-Hal Stebbins, Inc.

Thayer Scale and Engineering  
Corporation 128  
Agency-F. P. Walther, Jr.  
and Associates

Thermo Electric Co., Inc. 84  
Agency-Fred Lange Associates,  
Inc.

Thomas Truck & Caster Co. 106  
Agency-The Biddle Company

Titeflex, Inc. 89  
Agency-John Falkner Arndt  
& Co., Inc.

Tokheim Corporation, General  
Products Division 210  
Agency-Jones & Taylor and  
Associates

Towmotor Corporation 98  
Agency-Howard Swink Ad-  
vertising Agency, Inc.

Trane Company, The 207  
Agency-Campbell-Mithun,  
Inc.

Trent, Inc. 176  
Agency-George C. Taylor

Tri-Clover Machine Co. 65  
Agency-Russell T. Gray, Inc.

Tri-Lok Company 60  
Agency-Ketchum, MacLeod  
& Grove, Inc.

Twin Disc Clutch Company 208  
Agency-Spencer Curtiss, Inc.

U

U. S. Electrical Motors, Inc. 186  
Agency-The McCarty Com-  
pany

U. S. Industrial Chemicals Co.,  
Division of National Dis-  
tillers Products Corporation 26  
Agency-G. M. Basford  
Company

U. S. Stoneware Co., The,  
Plastics & Synthetics Divi-  
sion 115  
Agency-Ralph Gross Ad-  
vertising, Inc.

United States Gasket Company 158  
Agency-The Michener Com-  
pany

United States Products Co. 208  
Agency-Marsteller, Gebhardt  
and Reed, Inc.

Union Carbide and Carbon  
Corporation, Carbide and  
Carbon Chemicals Company 23  
Agency-J. M. Matthes, In-  
corporated

Union Carbide and Carbon  
Corporation, Haynes Stellite  
Company 121  
Agency-J. M. Matthes, In-  
corporated

Universal Road Machinery Co.  
Robert M. Gay-Division 94

V

Vacu-Blast Co., Inc. 102  
Agency-Walther-Boland As-  
sociates

Valdura Paint Division, Amer-  
ican-Marietta Co. 114  
Agency-Turner Advertising

Vanton Pump & Equipment  
Corp. 124  
Agency-Mabool Advertising,  
Inc.

Vapor Recovery Systems Co. 186  
Agency-The McCarty Co.

Victor Chemical Works opp. 14  
Agency-Russell M. Seeds  
Company

Viking Pump Company 204  
Agency-J. M. Hickerson Inc.

Voss Co., Inc., J. H. H. 218  
Agency-Sam J. Gallay Ad-  
vertising

W

Wagner Electric Corporation 163  
Agency-Arthur R. Mogge,  
Incorporated

Walker Process Equipment  
Inc. 216  
Agency-Hollingsworth and  
Collins

Waukesha Foundry Company 150  
Agency-Morrison-Greene-  
Seymour, Inc.

Wedge-Wire Corporation 140  
Agency-Herb W. Bueger

Weighing Components, Inc. 128  
Agency-The Harry P. Bridge  
Company

Weinman Pump Mfg. Co., The 194  
Agency-Harry M. Miller,  
Inc.

Welding Fittings Corp. 3  
Agency-W. S. Hill Company

West Bend Equipment Corp. 100  
Agency-Morrison-Greene-  
Seymour, Inc.

Western Precipitation Corpora-  
tion 205  
Agency-Dozier Eastman &  
Co.

Westinghouse Electric Corpora-  
tion opp. 51, 182, 183  
Agency-Fuller & Smith &  
Ross Inc.

Weston Electrical Instrument  
Corporation 68  
Agency-G. M. Basford  
Company

Wheeler Insulated Wire Co.,  
Inc., The, Division of the  
Sperry Corp. 88  
Agency-Edward W. Robotbam  
& Company

Wiegand Co., Edwin L., Radi-  
ant Heater Division 153  
Agency-Smith, Taylor &  
Jenkins, Inc.

Wilbur & Williams Company,  
The 22  
Agency-Larcom Randall  
Advertising

Wilson, Inc., Thomas C. 196  
Agency-Michel-Cather, Inc.

Witco Chemical Company 27  
Agency-Hazard Advertising  
Company

Worthington Corporation,  
Steam Power Division, Ejec-  
tor Section 52  
Agency-James Thomas Chirug  
Company

Worthington Corporation,  
Steam Turbine Division 51  
Agency-James Thomas Chirug  
Company

Y

Yarnall-Waring Company 193  
Agency-The Michener Com-  
pany

Young Brothers Company 90  
Agency-Allied Advertising  
Agency, Inc.

Youngstown Welding & En-  
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Agency-Flad-Erwin Advertising

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alkali metals, fluorine, hot phosphoric acid and  
hydrofluoric acid. (Specify Style No. 402 Lubri-  
cated Teflon Blue Asbestos Packing without glass  
fiber core for hot phosphoric acid and hydro-  
fluoric acid).

When Teflon Packings fail it can only be due to

- (1) Lack of resiliency
- (2) Lack of lubrication
- (3) Cold flow
- (4) Expansion

Flexrock has licked them all with Style #401.  
Don't count Teflon out until you've tried it — at  
our expense — wherever Teflon Packings have  
failed in the past.

We'll gladly send you literature but you can't  
pack valves or pumps handling hard-to-hold acids,  
alkali, or solvents with a catalog — only #401  
itself will do the job.

Use the coupon to order 10 ft. of any size (made  
1/8 inch to 1 inch in gradations of 1/8 of an inch)  
and if it doesn't work to your satisfaction we'll  
cancel the invoice. You'll be surprised at its first  
cost — it's considerably lower  
than any other Teflon Impreg-  
nated Packing on the market.



**MECHANICAL PACKING DIVISION  
FLEXROCK Company**

3611 Filbert St., Phila. 1, Pa.

Mechanical Packing Division  
**FLEXROCK COMPANY**  
3611 Filbert Street, Philadelphia 1, Pa.

☐ Please send further information.  
☐ Ship 10 ft. length ☐ #401 or ☐ #402  
size \_\_\_\_\_ on memo invoice.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Please clip coupon to Company letterhead

When inquiring check CP 8744

on handy form, pgs. 2-3

CHEMICAL PROCESSING

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## "That's Interesting"

### Bouncing ball

A gimmick for maintaining top efficiency in furnace cleaners utilizes a baseball. The old horsehide is placed on top of the cleaner bag (made of long-lasting rayon), between it and the bag cage. When cleaner motor is shut off, the ball bounces, shaking dust and soot free of rayon. This innovation is included on cleaners produced by Empire Chemical Products Co., Dept. CP, 10 Longworth St., Newark 2, N.J. . . . check CP 8745, pages 2 and 3.

### Panacea for pallid plants

Chlorosis, resulting from excessive lime in the soil, is a condition which causes an unseemly pallor to appear on plants and trees. To brighten up the color and aid plant health, UCLA agricultural experts report an excellent effect using iron-containing chemicals known as chelating agents. This tonic may allow plants to survive in once-barren soil where irrigation water was previously too alkaline.

### Bottle battle

Baby's bottle battle — the problem of getting fed easily, but not too fast — has been solved by a nipple that won't clog or get limp, can be boiled longer without ill effect, lasts longer, and tastes better. The nipples, made of silicone rubber by General Electric, are expected to be available this year after completion of market tests.

### Wobbles?

If you've been feeling a bit shaky, maybe that fast pace you're setting isn't entirely to blame. Seems old *terra* isn't quite as *firma* as it could be. In fact, there are five people the world over (two in the US, one each in Italy, Turkistan, and Japan) who keep an eye on Mother Earth's aberrations from her axis. Sometimes, so says the report, she's as much as five feet off. (Westward)

### Hand-y radioactivity

A method of safeguarding the power press operator's hands against amputation uses principle of radioactivity. Press operator wears radioactive wrist bands or rings. When his hands are in the danger area, the radioactive units are detected by Geiger tubes located at the boundary of the area, and the press is not permitted to function until operator's hands are removed to a safe location.

### Search and research

With research so important a part of today's industrial programs, a clear definition of the term is desirable. Researcher Charles Kettering has (tongue-in-cheek) defined research as "an organized method of finding out what you are going to do when you can't keep on doing what you are doing now." (Silicate P's & Q's, Phila. Quartz Co.)

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## your corrosion worries...



Pipe fittings — 1/2" to 2".



*Whether your problem is limited to pipe fittings . . . or includes nuts or bolts, brackets or jackets . . . Jacox Corporation's rigid PVC\* products can be mass-produced in most every moldable shape.*

Jacox, as the exclusive molder of this tougher-than-ever plastic by the Jackson & Church-Hendry Process (with its inherent higher quality and lower cost production) is serving the chemical processing industries.

Rigid PVC's outstanding resistance to acids and alkalis, inertness, high impact and burst strength and light weight make it the ideal material for processing corrosion problems . . . and only the Jackson & Church-Hendry Process\*\* is able to injection mold\*\*\* this unmatched material on a production basis.

Inquiries relative to application of these new and better products are solicited. Write Dept. CP

\* Rigid unplasticized polyvinyl chloride

\*\* Patents pending

\*\*\* Fast cycling of injection molding machines makes this system inherently economical. Weak weld lines, characteristic of fittings molded by other methods, are eliminated.



Bracket for mounting outdoor electrical cutout.

Nuts and bolts in various sizes.



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When inquiring check CP 8746 on handy form, pgs. 2-3



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 you buy *protection*



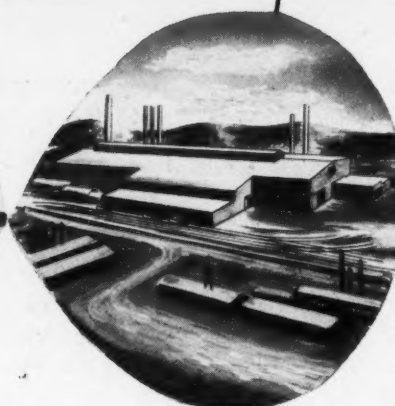
*In the Home*

Mastic floor tile now lasts longer and is made better due to Neville Resins. Common household items, like drain mats and bathroom mats, molded rubber products, even phonograph records, are far more durable, thanks to the use of Neville Resins. And rubber wire insulation, manufactured with these modern resins, protect the home.



*On the farm*

Neville Phenothiazine, used in proprietary medicines, protects cattle against disease. Neville Aromatic Solvents, used in making Insecticides and Herbicides, protect farm crops, and Neville Resins insure citrus preservation. Neville Resins also are used to make aluminum paints for farm buildings and Neville Shingle Stain Oils preserve wood surfaces.



*In Industry*

Coatings made from Neville Resins and Solvents protect valuable equipment, buildings and finished products from corrosion. Adhesives, floor tiles, foundry core oils, insulation compounds and rubber products—all do their job better because of Neville Resins.

Yes, when you buy Neville Chemicals, you buy protection . . . protection against the elements, against wear and tear, even against cattle and crop diseases . . . protection that comes from years of experience and research in this field.

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# chemical processing

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For more information on product at left, specify CP 8747 . . . see information request blank between pages 2 - 5.